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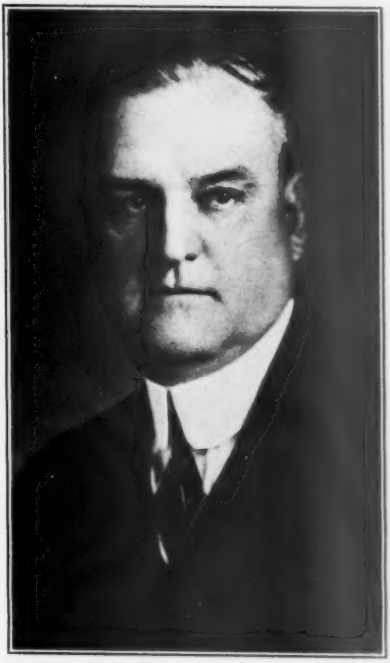

VAN H. MANNING

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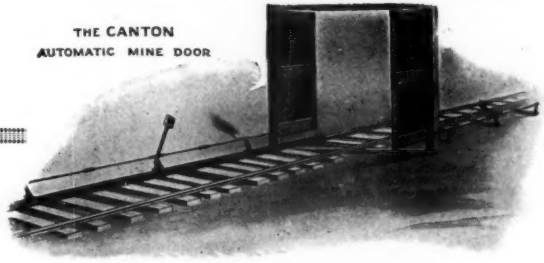

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First—Safety and efficiency in mining operations.

Second—Intelligent conservation with a view to the highest development and use of our mineral resources.

Third—The stimulation of investment in practical mining operations by showing that mining is a legitimate business when intelligently conducted.

Fourth—Uniformity in state laws governing mining operations carried on under like conditions.

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DELEGATES TO THE MEETING OF STATE MINE INSPECTORS HELD IN WASHINGTON, FEBRUARY 24 AND 25

VOL. 2, NO. 3 WASHINGTON MARCH, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

DELEGATES TO THE MEETING OF STATE MINE INSPECTORS HELD IN WASHINGTON, FEBRUARY 24 AND 25

SAFETY FIRST EXHIBITION ELICITS PRAISE OF PRESIDENT AND 35,447 VISITORS

Conference of State Mine Inspectors and Other Delegates Results in Strong Movement to Standardize State Laws and Regulations Affecting Coal Mining Throughout the Country.

A long step toward obtaining standardization and uniformity among the States in mining laws and mining practices was taken at the convention in Washington last month of State mine inspectors and others particularly interested in this phase of the mining industry.

At the request of the Secretary of the Interior mine inspectors and other delegates were sent from many of the coal and metal mining States to be present at the conference, which was a part of the program of Safety-First Week.

Under Government auspices twenty-five bureaus staged an exhibition which set forth graphically the safety-first work each is doing. Naturally the central position in a movement of this kind was taken by the mining industry, in which the life loss has been reduced decidedly by such methods.

Among the 35,477 persons who attended the exposition were a large number of mine operators. This is taken to indicate that the point has been reached where the mine operator is interested in safety methods as much as is anyone else.

Without question the best exhibit was that of the Bureau of Mines. In the very front was a large map on which the offices of the Bureau and the experiment stations being conducted by it, as well as the points where mine rescue cars are stationed were indicated by a different colored electric light.

Breathing apparatus mounted upon dummies clothed in characteristic mine costume attracted a great deal of attention.

Other features of the exhibit were: mine signal horns, lung motors, first-aid cabinets, oxygen resuscitators, fire damp detectors and first-aid lamps of various kinds.

A bird cage containing an imitation canary together with an explanation showing the use of the canary in detecting dangerous mine gases, attracted much attention.

One of the features of the Bureau's exhibjt was the display of radium. Two dark rooms were provided, which were open to the public, in which various of the optical features of radium were displayed.

Large crowds were attracted to the exhibit by the demonstrations of breathing apparatus in actual use. One of the Bureau's experts explained the use and advantage of the various types.

Much interest was shown in a model of rock dust barriers showing how the impact of an explosion cannot pass through the clouds of rock dust which are showered down by the air pressure caused by the explosion.

Very little of the Geological Survey work has a bearing upon safety. No effort was made by this Bureau to contribute a large exhibit. It did have, however, a representative display of maps, levels, theodolites, alidades transits, bench lamps and posts, aneroid barometers, steel tape and rods.

The Survey lays claim to being of important service toward saving life in its work of educating the public as to the dangers of a contaminated water supply. To this end some very clever drawings were on exhibit, showing how contaminated water may flow for a long distance through certain kinds of rock without being purified.

On account of the lack of uniformity in the statistical reports published by State agencies, and the multiplicity of reports required by various Federal bureaus and State departments from the operator, there is an urgent need to consolidate the various reports and standardize the manner in which these reports shall be

published, and for this reason the meeting of mine inspectors was called.

FISCAL YEARS

There are fiscal years ending in May, June, September, October, and November, in addition to the calendar years. It would simplify matters very materially if it were possible to bring about a calendar year for all official reports. If it is impossible to establish a calendar year, reports should be so published as to break in six months' or three months' periods, and then, by consolidating, a calendar year may be obtained. Thus, a State whose year ends June 30 might easily prepare its reports so as to represent six months' periods, and then statisticians and others interested could combine the last six months of a fiscal year with the first six months of the following fiscal year and thus produce a calendar-year report. Those whose reports are for years ending September 30 could accomplish the same result by preparing their reports covering quarterly periods.

NUMEROUS REPORTS

The various mining companies are now flooded with requests from Federal bureaus and State organizations for information relating to their operations. Many of these requests call for practically the same information but put up in somewhat different form, so that it really necessitates compiling the figures anew from the original records. The requirements are so at variance with each other that it is difficult to keep records that will suit the needs of all. Furthermore, requests for information come at the close of the year, and, perhaps, call for data that has not been kept by the operator. With standard forms adopted, the operator would know just what would be required of him at the close of the year and would keep his records accordingly.

The following abstract from the *Black Diamond* of February 12 was called to the special attention of the meeting:

"Today the average mine must make seventeen reports to State and Federal authorities. We will not attempt to enumerate them, but will merely indicate their character. One goes to the local inspector, another to the chief inspector of mines of the State, a third to the State Geological Survey, a fourth to some State department, a fifth to the Bureau of Mines, a sixth to the United States Geological Survey, a seventh to the Government intended for the revenue collector, etc. Each of these seventeen reports is different, although all embody about the same class of information.

"In addition, the reports have to be made out at many different times. Some are made every day, some every week, some every month, some for the year ending June 30, and some for the calendar year.

"This matter of reporting on mine operations is getting to be a nuisance. It is taking entirely too much time at the mines to get up the reports, and, for the amount of time involved, far too little use is made of the information after it has been compiled. That is, the mine operator makes a report, but the summary of it comes out too late for him to use the information. This amounts to a tremendous waste of money and effort.

"There is a way by which these reports can be consolidated and made of some use to the coal operator. That is, one report, very complete in every detail, could be sent to a central organization. This central organization could compile a statement to be used by the operators and by all the State and Federal authorities."

COOPERATION

Since the organization of the Bureau of Mines it has been its policy to cooperate wherever possible with the officials representing the State organizations. It has been felt that while the Bureau is able to collect certain statistical information from the operators direct, yet such reports are rendered voluntarily by the operator and in many cases are not as complete as they should be. A cooperative arrangement will have the benefit of being backed by the State laws which require the State officials to collect, and also require the mine operators to report, certain information relating to labor, accidents and production. If this data could be consolidated and standardized it could be used by the State organizations as well as by the Federal Bureaus. It would reduce the labor on the part of the operator in preparing several reports, lend the State departments whatever assistance the Federal Government may offer, and furnish the latter with figures which will be comparable, and, in fact, the same as those published by the State officials, thus avoiding the possibility of two reports being issued which will be at variance with each other.

With the enactment of the compensation laws more detailed information is being required of the operators, and this adds another commission to whom the reports are to be submitted. The requirements of the States and Federal Bureaus should, therefore, be so standardized that one report may be made to meet the requirements of the State compensation commissions, State inspectors, the Federal Bureau of Mines, and any other agency interested in mineral statistics.

In opening the first session of the mine inspectors' meeting, Mr. Manning said:

"This meeting was called for two purposes, and I want a full, frank, and free discussion of all subjects brought before the meeting. What we want is constructive criticism. The Bureau of Mines has provided suggested forms for mine statistics. This is presented to you in concrete form so that you will have something to go on. The Bureau of Mines has accepted the form of statistics prepared by the State of Pennsylvania, and it is thought that the Bureau ought to aid the State inspectors, industrial commissions, and other societies in adopting a standard form for statistics.

"The Interior Department, Department of Labor, and Department of Commerce are three large Government agencies engaged in collecting these statistics annually.

"The second purpose for which this meeting was called is to discuss informally with you the advisability of having a standard law for all

States so far as may be possible. This is a big job and it will take some time to get anything accomplished. As you know, many miners are migratory; they are here today and gone tomorrow; they are foreign-born, many of them, and do not read or write the English language so I do not know how far it will be possible for us to go. I understand that some of the States prescribe certain forms for collecting statistics, but in a very large measure they leave it to the inspector. This is a get-together meeting and I want to hear from all of you and the meeting is now open for discussion on these matters. I have furnished you gentlemen a copy of these suggested forms. I have prescribed here an order of business and if there is no objection on your part we will take that up and discuss it so that you will have something before you."

In explaining the need for uniform statistics and the advisability of compiling them for the calendar year, Albert H. Fay, statistician of the Bureau of Mines said:

"Legislative enactments relating to mine inspection and workmen's compensation in the various States are far from being uniform. One point of difference is the year covered by the report. A number of the States have fiscal years coinciding with the calendar year, whereas in other States the fiscal year ends in May, June, September, or November. With years covering such varying periods, it is not easy to classify matter relating to the mines so that information reported by one State will be comparable with that reported by another State. It would seem, therefore, that an effort should be made to have all of the reports coincide with the calendar year.

"Many other features of the reports are not uniform. This is especially noticeable as to the classes of mines the inspection service should cover. The mines subject to inspection differ; in some States all mines are included, whereas in others only those mines employing 5, 10, or 20 men underground are included. Compensation laws in most States apply to all mines, but in some they are elective at the option of the operator. Hence those operators who do not choose to accept State compensation will not be included in the commission's report, so that the report will not include all mines for the year in question.

"The forms contained herein are submitted for the consideration of the mine inspectors and the representatives of industrial commissions with the hope that they will be of aid in establishing a uniform system for recording and publishing data relating to the mining industry, with special reference to the various phases of mine accidents.

"In order that statistics may be of greatest value to the mining industry at large, they must be collected and tabulated on a standard basis. With the introduction of compensation laws, it is absolutely essential that accurate and reliable data be available in order that proper insurance rates may be established. Furthermore, uniform and complete details offer the inspectors, miners, operators, and all others interested an opportunity to make true comparisons as to conditions in other States and with other mines in the same State or district."

ADVOCATES CALENDAR YEAR

A. W. Donovan, Chairman of the Massachusetts State Board of Industry, said:

"I am firmly convinced that the time for all to close statistical reports is December 31, and my basis would be from the fact that the Federal Government is now asking all of the business houses and corporations to send in a report on the Federal income tax. That is sent in under the auditor's signature, in most cases, and the sworn statement, and for once in the year most of us have a sworn statement of the exact condition of the business, and from that particular time it would appear that it is much better than closing the fiscal year in May, June, September, or July; and from that record we would all have, as you suggested, a particular day and particular time from which to get our figures and statistics. I am very much in favor of the thirty-first day of December."

SITUATION ON NEW YORK

L. W. Hatch, chief statistician of New York State Industrial Compensation Commission, said:

"We are coming to feel that the calendar year is the thing we should come to. I imagine that our problem in arriving on the calendar year as the report is quite similar to what it is in other States where the fiscal year of the departments does not correspond with the calendar year, and laws usually require an annual report to the legislature. The fiscal year in New York, for example, is fixed by the legislature for ending September 30. As the department makes its tabulations quarterly, those States having years ending in May or November will absolutely have to change their periods, but a quarterly or half-year period would enable a recomputation for the calendar year at any time. That is what we are trying to do in New York. It is possible that the fiscal years in New York will shortly be changed to end June 30. What we propose to do in New York is to probably divide our year into halves, making tabulations six months apart, and then if necessary we will have to make it quarterly as has been suggested. That will simplify our problem a good deal. I am very much in favor, myself, aside from these computations due to the requirement of law or departmental requirements, of the calendar year ending December 31."

FAVORS CALENDAR YEAR

John Bohlander, President of the Illinois State Mining Board, said:

"In Illinois we have a year ending on June 30, and while it has seemed in the past to give general satisfaction, our mines as a rule are winter mines and the summer time as a rule is the dull season. It has always in the past been better to end on June 30, but for the sake of uniformity I am in favor of using the calendar year. The other matters could be easily arranged, I think, satisfactorily. Our operators claim that they are too busy in the winter time to give us a report, but we find that there is just as much trouble in the middle of the summer to get one. So we are in favor of the calendar year."

SITUATION IN ARIZONA

G. H. Bolin, State Mine Inspector of Arizona, said:

"Arizona's year ends November 30 and it is the duty of the inspector to make a report to the Governor in detail of the work he has done in the year on December 31, but the work done during the month of December is not included in that yearly report. The reason that this calendar year ends on November 30 is that the Governor is elected every two years and it is the duty of the inspector to report to the Governor, and it is necessary for the inspector to get his report in shape to present to the Governor before the first of the succeeding year. So far as I am concerned, I believe the matter could be arranged so that the year could end December 31."

DR. SMITH'S OPINION

Dr. George Otis Smith, director of the United State Geological Survey, said:

"In speaking of the question that is now before you it seems to me that the point that has been made that the influence of the corporation taxes and the returns of the corporations must eventually have a large influence in deciding this question in favor of the statistical year being the same as the calendar year. We have been speaking of the fiscal years of this and that State, but we must also consider the fiscal years of the corporations and I think that the point can well be made that the influence of the corporation tax law will be to make the fiscal year of the corporations more generally coincide with the calendar year.

"I believe that we must be of one mind. What we want is the fullest statistical information, the least possible trouble on the part of the reporting company. That is the reason that I think has actuated the chairman in calling this meeting, the idea being that the State and Federal agencies must as far as possible cooperate.

"In our own statistical work, in connection with the production statistics we have found it economical to cooperate with many of the States. I believe at the present time we cooperate with about twenty of the State Geological Surveys and of course it will occur to all of you that one of the purposes of such cooperation is the avoidance of duplicate reports.

"Another point which appeals to us strongly is the avoidance of two sets of statistics that do not agree. It is rather embarrassing to the student of such matters to find one set of figures bearing the State seal and another set bearing the Federal seal. I think that these differences have been reduced in the past and I trust that they will be further reduced in the future.

"When it comes to standardization of any kind, of course there is a limit that is set by natural law. I doubt if all statistics of the mining industry can be secured on one blank. A limited set will be desired in connection with the mineral production of the United States, and the work of our statisticians has been along the lines of reducing the forms used, thus putting as little burden as possible on the reporting companies."

UTAH'S POSITION

J. E. Pettit, State Mine Inspector for Utah, said:

"Our State has a fiscal year ending November 30. I was called upon to address a high school class the other day. I took the State figures and before I got through one of the professors got up and submitted the Government's figures and I was asked which were correct. Of course, I had to explain that they were both correct; one was taken for the fiscal year and the other for the calendar year. I realize that it would take a whole lot of energy and time to convince our legislature to change the fiscal year of the State. I think if the statements sent out by the Bureau of Mines requesting information each month would be shaped in such a manner that the dates of such fatalities could be shown it would simplify matters for States that are situated such as ours is. Then we have this staring us in the face. For the past four years we have had more fatal accidents in the month of December than any other month in the year, and that makes quite a material difference in our fiscal year and calendar year when the fatalities are computed. I would like to suggest to Mr. Fay that it might be a good idea if the dates of the accidents were put in, so that it could be put into the reports."

THE INSURANCE ATTITUDE

H. M. Wilson, representing the insurance interests, said:

"So far as the insurance companies which are concerned in underwriting coal mine risks on workmen's compensation are concerned, the policy year is the calendar year and I am quite confident that these insurance companies will be in hearty accord with any motion to make the calendar year the statistical year. In some cases the policy year is not the calendar year, but the statistical year is the calendar year."

CLASSIFICATION OF MINES

Some interesting discussion with regard to the classifying of gaseous and non-gaseous mines took place at the first session.

J. T. Beard, of *Coal Age*, said:

"Conditions in what are called gaseous mines differ from those in what are called non-gaseous. In this classification it would be a very essential idea to start out with a thorough classification, not only of mineral mines but of coal mines, and it would have this incentive that State mine inspectors would classify their statistics along the same lines, whereas if it was just simply made out in a general way they would not fit the classification."

RICE DIFFERS

Geo. S. Rice, chief mining engineer of the Bureau of Mines, took a different view. He said:

"In Pennsylvania the gaseous condition of the anthracite mines is not due to the character of the mineral, it is due to the geologic formation; the beds are heavily pitching and that is the real important feature. I have been in some of the iron mines in New York and they are quite

(Continued on Page 142)

HALF A MILLION DOLLARS ADDED VOLUNTARILY TO PAY ROLLS IN THREE UTAH CAMPS

Increased Pay to Employes Contingent on Price of Metals—New Potash Plant To Be Erected Near Marysvale—Van Law Succeeds Carpenter—Other Utah News

By A. G. MacKenzie

Salt Lake City, February 25—Between 6,000 and 7,000 metal miners of Utah are affected by voluntary wage increases announced in three Utah camps in January and February. Some of the increases were effective as of January 1 and others as of February 1. The continuance of the increased pay is made contingent on metal prices, according to the notices given out by the companies. These advances are in addition to increases previously given to mill and smelter employes and to office forces by some of the companies.

The new scale at Bingham gives increases of fifteen cents to twenty-five cents a day to about 3,700 men, the increase to remain in effect as long as copper is twenty cents or higher, New York quotation. The principal Bingham companies joining in the increase are Utah Copper, U. S. Smelting, Refining & Mining, Utah Consolidated, Utah-Apex, Utah Metals, Bingham Mines, Ohio Copper.

Tintic and Park City have announced an increase of twenty-five cents a day to remain in effect while silver is at fifty-five cents or higher and lead at $5.50 or higher.

The principal Tintic companies joining in the raise are Eagle & Blue Bell, Gemini, Ridge & Valley, Chief Consolidated, Iron Blossom, Grand Central, Lower Mammoth, Uncle Sam, May Day, Mammoth, Yankee, Colorado, Beck Tunnel, Dragon, Bullion Beck, Eureka Hill, Gold Chain, Opohongo.

The Park City properties affected are Daly-Judge, Silver King Coalition, Silver King Consolidated, Daly-West, Ontario.

It is estimated that the new scale adds more than $500,000 to the annual payroll of the three camps.

NEW ALUMNITE PLANT

Following the success of the potash plant erected by the Mineral Products corporation at Maryvale, Utah, the Frank R. Taylor company, of Philadelphia, through its representative, F. B. McCarthy, has announced at Salt Lake that it will build a plant, to cost $250,000, within three miles of Marysdale. It proposes to mine the alunite through shafts.

VAN LAW SUCCEEDS CARPENTER

C. W. Van Law, of Boston, second vice-president of the United States Smelting, Refining & Mining Company, has been elected president of the United States Fuel Company, succeeding E. L. Carpenter, of Salt Lake, who resigned recently.

A. B. Apperson, of Salt Lake, formerly superintendent of the Utah lines of the Denver & Rio Grande railway, has been elected general manager of the U. S. Fuel and has assumed charge of the company's extensive coal interests in Utah. He and Mr. Van Law went over the properties together recently and have decided on preliminary plans for improvements that will increase materially the output of the company's mines, the principal ones of which are at Hiawatha, Mohrland and Blackhawk, Utah. Increased electrical equipment is one of the improvement features to be taken up at once.

Mr. Apperson, the new local executive of the company, began railroad work in the West more than twenty years ago. He is not new to the coal mining industry, as he had charge of the railroad properties of the Consolidated Fuel Company for a little more than two years, leaving that service to join the Denver & Rio Rio Grande in 1909.

Mr. Carpenter was the object of much complimentary attention prior to his departure late in January for an extended pleasure trip to South America. He received a diamond ring from the employes of the U. S. Fuel Company, a silver loving cup from the Bonneville club of Salt Lake and was guest of honor at a special meeting of the Salt Lake Rotary Club.

Mr. Carpenter has been elected Vice-President of the Chesapeake & Ohio Coal and Coke Company, with headquarters at 120 Broadway, New York, and has already assumed his new duties.

WANTS ALL MINES INSPECTED

Legislation making approved safety-first methods mandatory for all mining properties employing more than twenty-five men is recommended by J. E. Pettit, state coal mine inspector, in his annual report just filed with Gov. William Spry, of Utah. He suggests inspection of metal mines as well as coal mines, the State having at present no provision for metal mine inspection, and recommends a single commission, with one deputy for coal mine and one for metal mines.

After pointing out that most of the large mines of the State already have first-aid instruction and mine rescue teams and equipment, he recommends that these features be required by law at all mines employing more than twenty-

five men and that the use of electricity in mines be regulated by law.

Mr. Pettit recommended that a commission be appointed to formulate his suggested code, but the governor, finding that he had no legal authority to appoint a commission for this purpose, has directed Mr. Pettit to embody in a report of his own the ideas he suggested be considered by a commission.

BRAFFET HONORED

M. P. Braffet, one of the best-known mining attorneys and operators of Utah, was elected president of the Salt Lake Mining & Stock Exchange, succeeding R. J. Evans, at the recent annual meeting of the Exchange. Mr. Braffet has been an officer of the Utah Fuel Company for many years and is extensively interested in metal mines in various Utah camps. He is a director and a member of the Executive committee of the Utah Chapter of the American Mining Congress.

SYSTEMATIC EXPLORATION OF SUB-STRATA NEEDED

Need for a more thorough knowledge of the strata lying below the surface throughout the United States is becoming accentuated with each passing year. Many suggestions have been made for some systematic drilling throughout the entire country, and the matter again is being considered by several of the government's experts.

The most desirable way, of course, is to have the federal government undertake the sinking of drill holes wherever the stratigraphy of the country is not known.

While the Geological Survey and the Bureau of Mines are very much in favor of having the work done by the federal government, so as to supply them with data which is greatly needed, it is quite certain that Congress would not look with favor upon the federal government undertaking such work.

The next possible course would be the undertaking of systematic drilling by the individual states. In several instances states have undertaken this class of work in limited areas with good results.

For many years the U. S. Geological Survey has made every effort to secure the logs of wells drilled in different parts of the United States where the sub-strata were not already known. The difficulty, however, of securing cooperation from private drillers can be well understood since considerable trouble and expense are necessary in order to keep an absolutely correct log.

In metal mining regions of the West development work has been done almost exclusively on out-croppings of mineral veins. Since only a small percentage of the veins reach the surface the economic value of systematic drilling can be well imagined.

At Bay City, Mich., a hole was drilled to a depth of 3,500 feet in the hope of discovering an underlying bed of rock salt. Ten thousand dollars were spent in the effort and no rock salt was found. Since that time it has been demonstrated clearly that the $10,000 were very well spent because of the geological information which was made available, to say nothing of the money that otherwise would have been spent in useless drilling in an effort to locate salt beds.

In the oil regions much very valuable geological information has been furnished by the logs of the oil wells. In fact it is this very valuable information which proves beyond all question that a general drilling of the country would be an advisable undertaking.

One of the most important results in some portions of the country would be the mapping of the underground water supply. The government has done some drilling on public lands and upon Indian lands with the idea of developing water, and some work upon a small scale has been done in the search for potash and phosphate.

MOLYBDENUM DEPOSITS ARE DISTRIBUTED WIDELY

Molybdenum deposits are found in almost every large area of granitic rocks, though most of the deposits are small, frequently only a few flakes at a place. The largest known deposits in this country appear to be in Colorado, Montana, Idaho, Washington, and Maine. In Colorado a deposit has been worked near Empire by the Primos Chemical Company, of Primos, Pennsylvania. A deposit at Climax, Summit County, is being worked and the ores are milled by the Pingree Mines and Ore Reduction Company of Leadville, Colorado.

Methods of mining vary with the deposit. Where the deposit occurs as at Aurelia, Washington, in comparatively large lumps of molybdenite the ore is hand picked and cobbed. Where it is distributed through the rock in fine scales then it must be separated either by oil or water flotation or some similar process. Roughly, the metal is separated by reducing the molybdenite, in which form molybdenum is usually found, to ammonium molybdate or to the oxide, and this is then reduced either by heating with carbon or by heating with a reducing gas.

The market value of molybdenite is a matter of bargain between the producer and the purchaser. There is no established market price. The price may range from twenty cents to $2 a pound, depending on the ore, the place, and the needs of buyer and seller.

The cost of mining varies so much with conditions that no estimate can be made without knowing the circumstances.

Wulfenite, the lead molybdenite, is also used as an ore of molybdenum. Deposits are mined in the Caballoe Mountains near Engle, New Mexico, at Mammoth, Yuma, and other places in Arizona.

PREPARE PRELIMINARY BIG HORN BASIS REPORT

A preliminary report on the anticlines of the Big Horn Basin is nearing completion in the hands of D. F. Hewitt and C. T. Lupton of the United States Geological Survey.

This report will describe forty anticlines, of which eight have already been shown to contain oil and gas. The report will sum up three years' field work.

INCREASING CONSUMPTION OF GASOLINE CHIEF REASON FOR PRICE ADVANCE

Government Furnishes Congress with Concrete Information with Regard to the Sources of Supply, Methods of Refining, and Facts Concerning Petroleum Production—Oil Shales of West May Be Utilized Sooner Than Expected Heretofore

The Secretary of the Interior has submitted to the Senate a valuable compilation of information concerning gasoline. The conclusions drawn from this report are as follows:

The consumption of gasoline is rapidly increasing.

The production of crude has been generally regarded as near its maximum.

Some immediate relief may be afforded by means of the following:

(*a*) The use in internal combustion engines of heavier distillates approaching kerosene.

(*b*) An acceptable kerosene carburetor would at once go a long way toward relieving the present shortage of gasoline.

(*c*) General use of cracking processes whereby gasoline is made from kerosene and other less valuable petroleum oils. Such cracking processes are being rapidly developed and promise near relief. It is practicable to produce gasoline from kerosene, gas oil, fuel oil, residuums, and heavy crudes by present-day cracking processes, and no oil should be used for fuel that has not been so treated.

(*d*) Increasing the production of crude to furnish the necessary supplies of gasoline, but this is not to be recommended if it increases the output of distillates for which there is no market.

Looking to the future, benzol may be considered as a substitute for gasoline, and oil-shale as a substitute source of gasoline.

Benzol, a hydrocarbon not greatly different from gasoline, is recovered as a by-product in the manufacture of coke. At present benzol is not likely to find favor with automobile owners in the United States as a substitute for gasoline, although in general use in Europe. The objections made to it as a motor fuel are that it requires adjustments in the motor, and that the quantity of it available will be so limited as to preclude widespread distribution and ready availability at every cross-roads corner, which the gasoline user has come to expect.

The quantity of benzol produced in by-product coke ovens in the United States in 1915 was approximately 14,000,000 gallons, and at the present rate of production, and taking into account new plants under construction, the output in 1916 will be at least 22,000,000 gallons, or about 500,000 barrels. This quantity will be consumed in the manufacture of explosives, dyes, and chemicals such as carbolic acid, a type of demand, however, that is expected to be much smaller following the termination of the European war, which has resulted in the present high prices. Under normal conditions the price has been 20 cents or less a gallon.

The quantity of coal now made into coke is 60,000,000 to 70,000,000 tons annually and as under present practice the yield of benzol is 2 gallons from the ton of coal, the universal use of by-product ovens would increase the present production of benzol to over 3,000,000 barrels. The coal reserves available for the future production of benzol are enormous, but production of benzol as a substitute for gasoline cannot be expected to draw on these reserves faster than the demand for coke and for by-products other than benzol justifies the coking or distillation of coal.

The oil shales in Colorado and Utah constitute an undeveloped reserve of petroleum, to which attention was directed by the Geological Survey in 1901. Field investigations of these deposits are being carried on by the Survey to ascertain the distribution, richness, and quantity of these shales, and tests made by the Bureau of Mines to determine the most efficient methods of their utilization.

These oil-producing shales in northwestern Colorado have been examined with sufficient detail to warrant the estimate that there are thirty-nine townships (1,400 square miles) underlain by an average thickness of 53 feet of shale in beds 3 feet or more in thickness, which, according to field tests, will on distillation yield an average of 25 gallons of crude oil per ton of shale. The crude oil thus obtained will give under ordinary refining practice approximately 9½ per cent gasoline, and doubtless much larger amounts by modern cracking processes. There is in northeastern Utah an oil-shale area approximately equal to that in Colorado, and it is estimated that the shale in this State will have equal thickness and quality, thus doubling the total possible yield. Oil shale beds generally thinner or less rich are present also in southwestern Wyoming, and similar shales are known in the Eastern States.

The net result of the examinations already made is that these oil-shale areas in Colorado and Utah constitute a latent petroleum reserve, whose possibly yield is several times the total remaining supply of petroleum. The gasoline content of the petroleum that can be distilled from these shales can be conservatively stated in billions of barrels.

The development of this enormous reserve simply awaits the time when the price of gasoline

or the demand for other distillation products warrants the utilization of this substitute source. This may happen in the near future. At all events these shales are likely to be drawn upon long before the exhaustion of the petroleum fields. Shales of no greater oil content have long been mined and distilled in Scotland.

FLOTATION PROCESS NOW USED AT IMPORTANT UTAH MINES

The most notable improvement in the milling processes of the large copper mining companies in New Mexico and Arizona is the adoption of flotation, according to Professor Robert S. Lewis of the State School of Mines of the University of Utah. Professor Lewis, working in cooperation with the Salt Lake City station of the United States Bureau of Mines, recently made an extended trip to copper properties in those states:

Professor Lewis reports that owing to the high price of copper the companies are operating at full capacity. Nearly all the mines have a sliding wage scale, that varies with the market price of copper, consequently the miners are receiving maximum pay, and what might almost be called a boom spirit pervades the camps.

Many minor changes have been introduced in the milling methods, but the most notable improvement is the adoption of "flotation" treatment, either in whole or in part, by all the companies. With one exception, the mills have been in operation for several years, and flotation treatment has been added, but as an extension to former methods of concentrating the ores, it not being considered expedient to reconstruct the entire mill until the possibilities of flotation were more fully determined.

The weakness of the present systems of gravity concentration lies in the inability of the machines employed to make a high saving on the finest part of the ore, commonly known as slimes. The very finely divided mineral floats off on the water and cannot be saved by methods utilizing the difference in specific gravity between the valuable mineral and the waste or gangue as a method of separation. When treating an ore by flotation process, the valuable mineral is caused to float on the top of the water in the machines as a froth that is removed and the mineral recovered. The gangue or waste sinks to the bottom of the machines from where it is sent to waste. Generally speaking, the finer the ore is ground the more suitable it becomes for flotation treatment. It is evident that this method is a valuable aid to gravity concentration.

In what might be called the present combination treatment, the coarser mineral is removed by gravity concentration, and the fine mineral is recovered by flotation treatment.

The mill of the Inspiration Consolidated Copper Co., at Miami, Ariz., is a notable exception in that only the flotation process is used. This company has over 100,000,000 tons of 2 per cent copper ore in its mine, making it one of the leading copper properties of the country. The treatment of the ore is quite simple. It is first crushed to small size, then ground to the required fineness and sent to the flotation machines, which give a "concentrate," containing nearly all the valuable mineral in the ore, and a waste product or "tailing" that is thrown away. The concentrate is smelted and the copper content covered in the metallic state.

Conservationists may decry the fact that only from 60 to 65 per cent of the copper in the ores is recovered by ordinary milling methods, but it should be remembered that companies must be financially profitable in order to continue operations. A higher percentage of recovery is possible, but not profitable, due to the large increase in the size and cost of plant that would be required to obtain a higher extraction, and the comparatively small added saving effected.

The addition of the flotation process to gravity concentration plants has resulted in a profitable increase in the percentage of extraction, sometimes as great as 10 per cent. Since each additional saving of one per cent means an increase in output of 12,000 pounds of copper per day—considering the production of four of the largest companies alone—the economic saving to the country is seen to be of great value.

WANTS GOVERNMENT TO DO PROSPECTING FOR TIN

That the United States undertake certain tests of tin deposits has been suggested by S. H. Chauvenet, who has been identified with tin mining in the Franklin Mountains in the El Paso area.

Since the Government has done prospecting for potash, and has conducted some exploration work for coal and phosphate, Mr. Chauvenet is of the opinion that it would be greatly to the benefit of the nation to undertake certain drilling to establish the extent of tin deposits.

The need for developing tin in quantity somewhat commensurate with the demand, is just as necessary, Mr. Chauvenet believes, as is the discovery of potash and phosphate in commercial quantities.

Mr. Chauvenet spent $50,000 exploring the Franklin tin deposits. He believes that he has opened a mine of real value, but he is not in a position to do extensive drilling, which would be necessary to establish absolutely the value of these deposits.

It is not his idea that government drilling be confined to any one area, but he urges it be undertaken in South Dakota and North Carolina, or any other place where sufficient development work has been done to demonstrate the presence of considerable bodies of tin.

At Tinton, S. Dak., there is a considerable quantity of tin ore in sight, said to average 1 per cent per ton. At King's Mountain and Lincolnton, N. C., it is agreed that considerable ore exists, which runs 1 per cent per ton or better.

In England mines are being operated at great depth with antiquated methods which contain less than 1 per cent of tin. The known deposits in the United States have the very material advantage of containing few detrimental minerals.

NATIONAL CONSERVATION CONGRESS TO TAKE UP VARIOUS MINING TOPICS

Elaborate Plans Being Made for Meeting in Washington May 2, 3 and 4—Preparedness to be Discussed from Standpoint of the Miner and Other Producers —Best Means of Mobilizing Resources to be Considered

Many questions of importance to mining will be discussed May 2, 3 and 4, upon the occasion of the meeting of the National Conservation Congress. The keynote of the meeting will be questions effecting national strength and efficiency.

It is the intention of the Conservation Congress to go into the subject of preparedness much nearer its source than the making of big ships or the creating of an army.

At the meeting of the executive committee of the Congress, which was held last month in Washington, it was pointed out that conservation means more than saving. Some define it as being the fullest possible development with the least possible wastage.

Prof. G. E. Condra, of the University of Nebraska, President of the Conservation Congress, has developed many original ideas for making the meeting here in May one of the most comprehensive that ever has been held. He made tentative arrangements, while here, with President Wilson and the Secretary of the Interior to address the Congress.

The United States has been divided into nine regions in which fundamental industries center. One speaker has been chosen from each of these regions. Each representative will point out how nearly their industries are prepared for any emergency, and what steps are being taken to reduce waste.

In an effort to ascertain just what features of procedure of other countries should be adopted in this country and just what practices in other countries it would be best to discard, this subject will be discussed by speakers selected from naturalized citizens of the principal countries with which the United States has important commercial relations.

Moving picture films are to be used frequently during the Congress in an effort to impress more clearly the vastness of the resources and industries of the United States.

The entire second day of the Congress is to be devoted to a discussion of the best methods to mobilize the resources of the United States.

An important part of the work at the convention is to be done by committees. For instance, the committee on iron, which is in charge of E. F. Burchard, of the U. S. Geological Survey, will compile data with regard to how much of this important metal can be made available in case of an emergency. The committee probably will point out the necessity of opening iron deposits in other sections of the country so that, in the event of a successful invasion of a portion of the United States, it would not be possible to cut off the available supply.

Another committee will have charge of mineral fuels. Experts on coal and petroleum will bring out from a new angle many interesting features in regard to these highly necessary articles.

Maps will be used extensively in calling attention to the mineral resources of the country. A string will connect a sample of iron ore, for instance, with the district in which the ore is produced. This plan will be followed with respect to many of the important minerals of the country.

The need of fortifying this country with a sufficient nitrate supply is to have an important place in the deliberation of the Congress. Water power also is to be considered from several angles which have not been discussed widely.

Preparedness with regard to education, vocational guidance, discipline and other related questions will be taken up. The waste in education is great, it is claimed, and certain experts, including the United States Commissioner of Education, will point out where this unnecessary inefficiency can be reduced to a minimum.

Chemical preparedness is one of the various other questions which is to receive very minute attention at the meeting.

URGE COOPERATION WITH THE BUREAU OF MINES

An indication of the friendly feeling of the United Mine Workers of America for the Bureau of Mines is indicated in a committee report at the recent annual convention of the organization.

The committee report was put to vote and was carried. It reads as follows:

"With regard to the Bureau of Mines the committee concurs in the advice that the membership everywhere participate in and aid the work of the bureau and approve the organization cooperating with others in the creation of a memorial to Dr. J. A. Holmes.

"We approve the passage of an act creating the Bureau of Mines into a Department of Mining, with the secretary thereof a member of the President's cabinet.

"Delegate Lord, District 12, spoke in support of the report of the committee and called attention to the great importance of the bureau to the mining industry.

"The question was discussed briefly by Delegate Kennedy, District 7, and President White.

"The motion to adopt the report of the committee was carried."

DR. PARSONS TALKS TO SCIENTISTS ON RADIUM

In an address before the Cosmos Club of Washington, Dr. Charles L. Parsons, chief of the division of mineral technology of the Bureau of Mines, reviewed the work that has been done by the Bureau in its radium work. In part he said:

"The work of the Bureau of Mines on radium began in the fall of 1912. A preliminary report published in the summer of 1913 outlined the conditions of mining and the wastes involved in the carnotite ore region of the West. As a result of this investigation, Dr. Howard A. Kelly of Baltimore and Dr. James Douglas of New York City were interested, and they incorporated the National Radium Institute. This institute leased certain carnotite claims in Long Park, Colo., with the right to extract 1,000 tons of carnotite ore therefrom. The National Radium Institute arranged with the Bureau of Mines for a cooperative investigation of the methods of extracting radium from this ore and the saving of the wastes by the concentration of the low-grade ore formerly thrown on the dump.

"Sufficient funds were furnished to be expended under the direction of the Director of the Bureau of Mines, and the first plant was built in the spring of 1914, beginning production on an experimental basis in June, 1914. The result of the preliminary investigation was so successful that the institute authorized the construction of a second and larger plant which began operations in February, 1915; the two plants have been run continuously since that time.

"The object of the investigation was to procure an adequate supply of radium for the treatment of cancer in the two hospitals connected with the Radium Institute and to develop methods of extraction whereby the miners might obtain a more adequate return for their ore, which, before this investigation began, had been sold largely to foreign manufacturers. Incidentally, methods have been developed for the preparation of sodium uranate, uranium oxide, and iron vanadate—by-products from the extraction of carnotite ore. Before the Bureau's operations began, several methods, the details of some of which have been kept secret, had been devised for the extraction of radium from pitchblende and from carnotite. These involved (1) the use of an acid leach; (2) the use of an alkaline leach followed by acid; (3) fusing the ore with some material that would make extraction of the valuable contents possible. The acid leaches had been extensively used abroad and had shown an extraction of not over 70 per cent and probably little over 50 per cent of the radium content, owing to the fact that the ores contain sulphates, and any radium sulphate present was not removed under these conditions. The alkaline leach followed by an acid leach would probably remove more radium but involves such grave difficulties of filtration that it seemingly has not been put into commercial use. Fusing the ore with sodium sulphate was long employed on pitchblende and has been used in Australia by Radcliffe in treating carnotite that is obtained at Olary, South Australia. This carnotite, being mixed with ilmenite, is very different from the American carnotite. Fusion with sodium carbonate has also been employed in this country on carnotite ores but has the great disadvantage that it carries a large part, if not all, of the silica into solution. This adds greatly to the cost of operation and tends to give radium-barium sulphates of a rather high degree of impurity which require special treatment. From the best accounts available, it appears that this method does not successfully extract more than 70 per cent of the radium present in the ore.

METHOD OF ORE TREATMENT

"The method devised by the Bureau of Mines is based upon the fact that strong, hot nitric or sulphuric acid dissolves radium-barium sulphates in considerable quantities, as well as the other soluble constituents of the ore. Hence the radium-barium sulphate left behind when dilute acids are used for leaching is obtained in solution and recovered. The use of strong, hot nitric acid, although it presented many difficult problems of chemical engineering, was chosen because the radium-barium sulphate could be precipitated at once in a remarkably pure form and the nitric acid could be largely recovered in the form of sodium nitrate and used again. Accordingly a nitric acid plant was built in connection with the radium plant and has been regularly operating since February, 1915.

"In the Bureau of Mines method, the ore, pulverized to 20 mesh, is fed into an earthenware boiling kettle containing 38 per cent nitric acid. The nitric acid is brought nearly to boiling by means of steam passed through a glass tube. When the boiling point has been nearly reached the ore is added a shoveful at a time and the whole stirred, heating being continued. After the ore has all been added, heating is continued for fifteen minutes when the mass is run on to an earthenware filter and the nitric acid separated from the ore by suction. The ore is re-treated with hot nitric acid of one-third the original strength, and is then washed with hot water. This treatment brings into solution nearly all of the uranium, about 50 per cent of the vanadium, and practically all of the radium present in the carnotite. The residue is discarded. The filtered solution is stirred, and sodium hydroxide is run in slowly with the object of reaching as nearly as possible the neutral point without forming a precipitate. If too much sodium hydroxide is added, both iron and vanadium are precipitated, discoloring the radium-barium sulphate. On the other hand, if not enough sodium hydroxide is added, the acid remains too strong and the solvent action of the nitric acid on the radium-barium sulphate is not sufficiently decreased. By a little practice the right point is easily obtained. Barium chloride is then added in the proportion of 2 pounds of $BaCl_2$ to 1 ton of ore and is thoroughly stirred in, and 15 pounds of sulphuric acid to 1 ton of ore are then added. As the ore contains some barium it is necessary to add only a comparatively small amount of this material to accumulate the radium. The whole mass is vigorously stirred for one hour; the solution is then elevated to conical tanks where it is allowed to settle,

usually for three to four days. The supernatant liquid is siphoned off for the recovery of uranium and vanadium and the radium-barium sulphates are collected on an earthenware filter, washed, treated with dilute sodium hydroxide, and dried."

Continuing, Dr. Parsons told of the refining; separation and purification of uranium; recovery of vanadium; nitrate recovery; recovery averages and gave cost data.

SENATOR WADSWORTH SOUNDS WARNING AGAINST STRIKE

Washington *Post.*

Directing attention in a recent address to the pending demand of railway conductors, trainmen, engineers and firemen all over the country for an eight-hour day and pay and a half for overtime, Senator Wadsworth, of New York, sounded a warning against any strike ultimatum. It has been suggested that the railroad employes early in March would not only submit their demands for a $100,000,000 increase in wages under the name of an eight-hour law, but would couple it with an announcement that any offer of arbitration would be rejected.

It would be deplorable if the railroad employes should adopt such a course. Even the employes themselves will recognize the merit of Senator Wadsworth's friendly warning:

"I say to you in all solemnity that, big as you are, powerful as you are, determined as you are, your cause will be lost in the very statement of it if arbitration is refused, and I say this with no possible disparagement of the merits or justice of your demands. Whether you will strike or not is up to you. But if you couple with it the declaration that the claims of the railroad companies are not even justifiable and that all offers to that end will be rejected by you, then I tell you you must arbitrate or take the consequences."

Senator Wadsworth pointed out that every railroad is a post and military road of the Government, made such by act of Congress, and that government itself is but the executive of the public will. If the employes should make demands upon the railroads which are refused for reasons good, bad or indifferent, it is scarcely possible that the public will pause in its innumerable activities to wait with folded hands the outcome of the contest. The Government itself would be compelled to break such a strike even by running the railroad itself and then forcing arbitration.

It had been understood for nearly a month that the railroad employes would definitely include a refusal to arbitrate in their new wage demands. The demands will be made early in March, but it is inconceivable that the employes would decide the case against themselves by rejecting arbitration in advance. That is what a refusal to arbitrate would mean. Senator Wadsworth, in Washington as at Albany, has been a friend to labor. The warning he has issued is a warning by a friend to those whose welfare he seeks to conserve. There is little doubt that his words will have weight with the great organizations which are now formulating their demands.

COAL WAGE SCALE CONFERENCE

Each Side Hopes for an Early Adjustment

The committee having in charge the adjustment of the bituminous wage scale for the States of Illinois, Indiana, Ohio, and Pennsylvania, began their adjourned meeting at McAlpin Hotel in New York City on February 24. At the first meeting in Mobile, Ala., substantial progress was made, but no conclusion was reached. The question of an advance in scale was temporarily disregarded and the question of what should be the basis of a mine run rate for Ohio, Indiana, and Pennsylvania, was first under consideration. The operators insist that if a mine run basis is accepted that the rate should be 44.61 cents for machine mined coal, mine run in Ohio and Pennsylvania, while the miners insist that it should be 47 cents. The Indiana operators claim that if a mine run basis is accepted, that it should be on the basis of the Danville agreement, 61 cents for pick mining, and insist on existing machine differentials of 10 cents for punching machines and 12.5 cents for chain machines. The miners concede the 10 cent differential for punching machines, but insist on a 10 cent differential for chain machines also. Both sides stand firm for their respective demands, but a feeling exists that an agreement will be reached. Operators representing the respective States were in attendance as follows: *Illinois*, C. M. Moderwell, E. T. Bent, A. J. Mooreshead, S. A. Shafer, James Needham, James Forester, W. B. Jess, Rice Miller, W. L. Schmick, W. J. Spencer, J. W. Gilchrist, L. H. Smith, E. C. Searles, Thomas S. Brewster, Herman Perry, P. J. Wilson, H. E. Bell, Carl Scholz and C. E. McLaughlin; *Indiana*, J. K. Dering, J. C. Kolsem, Philip Penna, A. M'Ogle, M. L. Gould, David Ingle, W. J. Freeman and Homer Tally; *Ohio*, C. E. Maurer, Michael Gallagher, W. H. Haskins, John H. Winder and G. C. Weitzell; *Pennsylvania*, W. K. Field, W. W. Kiefer, George Schluederberg, John A. Donaldson and John H. Jones.

Thursday, March 2, has been fixed as the date of conference between the anthracite operators and the miners.

ENCOURAGED BY DISCOVERY OF PLATINUM IN SPAIN

Great interest has been manifest at the United States Geological Survey in the reported discovery of platinum in Spain. The announcement simply tells of the certainty of the presence of platinum in characteristic formation in the Ronda hills in the Province of Malaga and mentions no extensive prospecting.

If platinum can be developed in commercial quantities in Spain it will be welcomed by users of platinum in this country, where the demand is constantly increasing. As has been stated frequently, the chances for developing platinum in any large quantity in this country are practically nil.

STEP IS TAKEN TOWARD MINERAL INDEPENDENCE

As the result of investigations conducted by the Bureau of Mines the United States within a very few weeks will be entirely independent of other countries in regard to kaoline.

This achievement of the Bureau of Mines is regarded here as an indication of the importance of the work of this bureau in making the United States independent of foreign mineral supplies. While the results will not be as far reaching as the Rittman discoveries of oil refining processes or the accomplishments of the Bureau in reducing the number of explosions and deaths in mines, yet disinterested experts hold that in principal the kaoline achievement must be given rank with the other notable accomplishments of the Bureau.

The division of mining technology, under the direction of Dr. C. A. Parsons, has been experimenting for two and one-half years in an effort to purify the secondary kaoline which occurs in extensive deposits in Georgia.

The actual work has been in charge of Ira E. Sproat. It is possible to produce a kaoline which equals the best of the imported product, and within a short time it will be possible to supply from American deposits sufficient kaoline to meet the entire demands of the United States.

ARKANSAS "LAKES" PROBABLY NEVER CONTAINED WATER

The U. S. Geological Survey just has completed an investigation of Tryanza and Hickory Lakes in northeast Arkansas. These so-called lakes are not lakes at the present time, but it is claimed they were lakes at a previous time.

If it can be shown that they were lakes and have since become land, the area belongs to the riparian claimants. If the old survey proves to be in error or is fraudulent, the land belongs to the government and is open to homesteading. An examination of other lakes in the same part of the State developed good geological evidence that there were no lakes there in 1840.

Each existing map, even to this day, gives these lakes as water, despite the fact that it is practically certain that water never existed there. It is possible that the original surveyors did work in the region during the time of the overflow, and marked the lakes in error.

No Demand for Tantalum

Tungsten has replaced tantalum in the making of incandescent electric lamp filaments, and there seems to be no other use for tantalum which is sufficient to create a market for the ores.

GEOLOGICAL SURVEY MAY BE GIVEN ADDITIONAL FUNDS

Appropriations of $160,000 additional have been requested this year by the U. S. Geological Survey, and the matter is now before Congress in the Sundry Civil Bill.

One hundred thousand dollars of this amount is for the development of water resources in some of the desert valleys of the West. It is proposed to conduct boring operations with an idea to discovering water bearing strata which will make irrigation possible.

Fifty thousand dollars of the additional amount requested is for geologic work. This simply replaces the item cut from the appropriation for 1915, due to the general effort at that time to reduce government expenditures.

The additional $10,000 is for printing maps. This is made necessary by the increased demands for topographic maps published by the Survey.

CHANCE FOR BIG PROFIT OFFERED AMERICAN MINER

Some American miner has an opportunity to make a splendid profit if he can produce metallic arsenic within the next few months.

Previous to the war all metallic arsenic consumed in this country came from Germany. The consumption of this product in the United States is not great, as the imports before the war averaged only 8 tons monthly. Since the war, for some inexplicable reason, the demand has grown so that 25 tons per month are being consumed.

The visible supply is about exhausted, and there seems to be little opportunity of replenishing it until the German ports are open.

Frank L. Hess, the United States Geological Survey specialist on rare metals, has the following to say in regard to arsenic production during 1915:

"The year 1915 saw another increase in the output of white arsenic, and the estimated production for the twelve months is reported by the United States Geological Survey to have been 5,195 tons (of 2,000 pounds) with a value at the smelters of 2 cents a pound or a total of $207,780. The estimate by Frank L. Hess is based on the known production for the first ten months of the year and the probable output during November and December. This output is an increase of more than 11 per cent over the 1914 production and 65 per cent over the 1913 output.

"All white arsenic made in this country is a by-product in the smelting or refining of the non-ferrous metals, and naturally the larger part is saved at the western plants. The demand is far below the possible production, which could probably be made treble or quadruple the present output if prices were sufficiently encouraging.

"The largest uses for arsenic are in the manufacture of insecticides, such as Paris green, lead arsenate, etc.; in glass making; and as a weed killer. Small quantities are used in shot, medicine and dyes.

NEW HOME OF THE INTERIOR DEPARTMENT AS IT APPEARS TODAY.

The Bureau of Mines, Geological Survey, Land Office and the Reclamation Service are among the Bureaus Which Will Occupy this Edifice

MINING ON BOOM IN TENNESSEE AND VIRGINIA

Mining in Tennessee and Virginia is picking up with a rapidity which is attracting attention. The price of zinc and the increasing demand for iron pyrites is becoming very much greater. A number of properties that have been idle have been started and numerous prospects are being opened.

The demand for pyrites comes largely from sulphuric acid manufactures. The war has so increased the demand for this acid that it is with difficulty that the demand is being supplied. Increasing ocean freight rates are militating more and more against the use of Spanish pyrites.

OTHER ORGANIZATIONS JOIN HOLMES' MEMORIAL ASSOCIATION

Additional societies have affiliated themselves with the Joseph A. Holmes Memorial Association during the past month, as follows: Western Federation of Miners; Society for Testing Materials; Society for the Promotion of Engineering Education and the Mining Ins. Institute of the United States.

An important meeting of the association will be held March 4.

MANY PLACES TO INVESTIGATE POSSIBILITIES OF GAS OCCURRENCE

Since the examination of the area around Dallas and Fort Worth, Texas, by the U. S. Geological Survey engineers to determine certain facts in regard to the presence of gas and the probable available supply, numerous requests have come requesting information as to conditions under which similar examinations will be made. Wherever possible the Survey will undertake cooperative work of this nature.

While these examinations are made of comparatively large areas in a very limited time, good results, as it gives an idea of the possibilities of exploration work there and also determines very definitely the present gas supply and its probable duration.

In the Dallas and Fort Worth area it was determined that there was no place where there is reason to suppose there is no gas.

The State of Mississippi now has under consideration a bill appropriating $10,000 for cooperative work with the idea of determining the most likely places in the State for the occurrence of oil and gas.

Will Exhibit at Centennial

The U. S. Geological Survey will contribute an exhibit to the Mississippi State Centennial which is to be held at Gulfport next year.

Alaska to Uncle Sam

While all Europe is a shamble,
And the whole world is at war,
And half the land the sun shines on
Is drenched in human gore;
When every nation counts the men
It knows are tried and true,
We send this message to you, Sam,
"Alaska stands with you."
You never treated us quite right,
You grabbed away our coal
And then reserved our firewood
And what we've used we've stole.
You soaked us on our cable tolls,
But we don't give a damn;
At twenty-eight cents per word, we say,
We're with you, Uncle Sam.

You've squandered untold millions
On the lousy Philippines;
But you always made Alaskans
Go and rustle for their beans.
Your black and tan possessions,
While they've cost you quite a few,
Can never be depended on,
But—we'd go to hell for you.
We're quite unused to luxuries,
We've always played alone;
When we asked for help to build our trails
You handed us a stone.
You four-flushed on the railroads,
But we don't care a damn,
If they monkey with the Eagle,
We're with you, Uncle Sam.

You gave us leave to make some laws
Then tied our hands behind.
This gift to us was just the same
As pictures to the blind.
Your laws all have a "joker,"
Made to catch some sour dough,
And its hard to beat your game, Sam,
The way it's framed up, down below.
We've always been the dumping ground
For your political misfits;
But Sam, if you're in trouble
We're willing to cry "quits."
We've never had an even break.
But we don't care a damn,
If the Lion growls, remember this,
We're with you, Uncle Sam.

We're used to meeting troubles,
And if you put us to the test
You'll find Alaska loves you, Sam,
Far better than the rest.
But Sam, when this is over,
As morning follows night,
Pray give us some attention
And set some matters right.
We need some decent cable tolls,
We need some decent mails,
We need some decent coast lights,
And we need some decent trails.
You've given these to all the rest,
But we don't care a damn,
If it's full grown men you're needing,
We're with you, Uncle Sam.

Pat O'Cotter.

Seward, Alaska.

CALIFORNIA SHIPS INCREASING AMOUNT OF CHROMITE EAST

Owing to the great demand for chromite brought about by conditions in Europe, the production for 1915 was much larger than any previous year. The imports upon which this country has relied so largely practically were cut off. This resulted in increased prices, which greatly stimulated the home production. California is the banner state in the production of chromite, and large quantities have been shipped to the eastern markets during the past year.

MUCH WASTE IN TREATING U. S. ANTIMONY ORES

As ordinarily practised in this country the treatment of antimony ore simply means hand picking so as to get rid of most of the waste and the richer ore only is shipped. At one place in Montana and near Kellogg, Idaho, oxide plants were at one time worked. In these plants the antimony ore is roasted under oxidizing conditions and the white oxide of antimony is volatilized, collected in chambers, and shipped. The oxide is used either as a pigment for paints or is smelted for the metal.

At two or three places in Nevada and California the ore has been "cruded," that is, the ore has been heated in crucibles and the native antimony sulphide, stibnite, which melts at a comparatively low temperature, has been allowed to flow out, thus forming what is known as "crude" or "needle" antimony. The process is wasteful but ores can sometimes be treated in this way and shipped where high freight rates and the low grade of the original ores would otherwise proclude shipment.

Antimony ore is found near Gillham, Sevier County, Ark. The other principal producing States of the Union are Nevada, California, Idaho, Montana, Oregon, Washington and Alaska.

GERMANS HAVE NO SUCCESSFUL SUBSTITUTE FOR COPPER

Opinion in Washington regarding the future of copper varies widely. Some well qualified experts believe that at the end of the war, copper will drop very low in price, while others present very convincing arguments to the effect that there will be little depression in price after the war.

Not a great deal of stock is taken in the reports from German sources that Germany and Australia are replacing copper so successfully with other metals, which they will continue in use even when copper is available. It is stated that soft iron, aluminum and brass, are being used extensively for wires to carry electric current. It is believed here that these simply are makeshifts which are vastly inferior to copper.

Aluminum ores for instance are very scarce. They are scarce in Germany. No one has developed a process of securing aluminum in commercial quantities from clay. Even if aluminum could be produced as cheaply as copper, it is not as suitable for electric transmission as the cross sections of an aluminum wire would have to be very much larger than that of a copper wire of the same current capacity.

In many sections where there are sleet and snow the desirability of using wires of small cross-sections is well-known. On interurban trolley wires, for instance, aluminum wire of the size to carry a sufficient load of current would be much more likely to be dragged down by the sleet and ice. The inferiority of iron and brass is also very well understood.

GEOLOGIST DECLARES SLIDES ARE NO MENACE TO THE PANAMA CANAL

Bureau of Mines Bulletin Tells Why Earth Slips into Big Ditch—Faults Have Cost United States Many Millions of Dollars More than Original Estimates

Some engineering problems of the Panama Canal in their relation to geology and topography are discussed in Bulletin 86 of the United States Bureau of Mines, just issued, Donald F. McDonald, author. Mr. McDonald was detailed as geologist to the Panama Canal while it was under construction. The paper aims to discuss from the viewpoint of the mining geologist the bearing of topographic and geologic conditions on certain problems that arose in the construction of the canal.

"The bulletin is published by the Bureau of Mines," says Mr. McDonald, "as a contribution to engineering literature, because it presents information that shows how geology and topography must be considered by the mining engineer in planning excavations and in removing loose material and solid rock in the safest and most efficient manner."

UPLIFT IS SLOW

As to estimate of the stability of the Isthmus of Panama, Mr. McDonald says, "In all, there is a clear record of four oscillations and the beginning of another elevation. Hence the question, Is the canal in danger from this uprise? Should the emergence be rapid of course it would be in some danger; but the fact is that the average rate of uplift for, say, the last 1,000 years has been something less than 0.03 foot a year ,or less than 3 feet in 100 years.

"It is believed that the sinking of the ocean bottom outside the relatively shallow depths of the isthmian shore waters has been the chief cause of the earthquake periods that have, so far as the records go, visited the isthmus every thirty to thirty-five years and that each of these seismic disturbances has resulted in some increased uprise of the land mass.

"From the various oscillations of the land above and below sea level, as already noted, one would expect that the rocks constituting the isthmian land mass would have become broken and dislocated in these upward and downward movements, and this has happened. Great fracture planes cut the rocks and trend mostly northeast-southwest, or approximately parallel with the axis of the land mass, with some minor fractures leading in other directions. Along these fracture planes differential movements, some of which measure hundreds of feet, have taken place. The frictional drag of these movements has crushed and broken the softer rocks for several feet on each side of the plane of motion.

INCREASED CANAL'S COST

"This faulting has had a most important bearing on engineering, because the faulted zones, especially where the rocks are extensively crushed and broken, have tended to promote slides. At any rate, so far as the digging of Culebra Cut is concerned, these faults have increased the cost of the canal several millions of dollars."

Mr. McDonald takes up quite fully the question of slides and especially those in the Culebra Cut. As to the slides, Mr. McDonald says: "Culebra Cut is a vast ditch that passes through many varieties of rock in the 9 miles of its length. Some of these are weak and unstable, and where the slopes of the cut were steep and 100 to 300 feet high the weaker rocks locally crushed down to flatter slopes. The flatness depended on the material involved, but, whatever the material, whenever the slope got flat enough the sliding stopped. At no time did the engineering staff constructing the canal believe that the slides were a menace to the ultimate completion and successful operation of the canal, in spite of the fact that at times they were somewhat troublesome. They have made necessary the excavation of about 30,000,000 cubic yards more than was included in the first estimates for Culebra Cut, but they have not in the past and will not in the future endanger the ultimate success of the canal.

CRACKS DEVELOP

"The largest and most important slides developed from structural breaks and deformations. Fortunately, they occurred only near Culebra in a section of the cut not much over a mile long. These deformations first manifested themselves by the appearance of one or of a set of cracks or fissures parallel or somewhat oblique to the edge of the cut, and from a few yards to some hundreds of yards back from it and from each other. Some of them were traceable on the surface for several hundred yards and gradually developed into perpendicular crevices up to one-third of a yard wide and many yards deep.

"The chief slides due to structural breaks have taken place in that part of Culebra Cut lying between Gold Hill and Empire Bridge. On the west side in this section of the cut sliding began in October, 1907, and extended so that in all over 70 acres of material moved or was seriously cracked. This movement necessitated the removal of over 11,000,000 cubic yards more than was comprised in the

first estimates. This amount, of course, included the material removed from the upper part of the slopes in order to make them less steep and more stable. Sliding began on the east side of this section of the cut about January, 1907. In all some 55 acres of land surface has been in motion here since then, adding close to 8,000,000 cubic yards to the first estimates. The relieving process on this part of Culebra Cut was in 1914 not yet quite complete, and a considerable amount still remains to be moved before perfect stability of slopes will prevail.

"The structural-break type of slide is therefore responsible for the movement of about 19,000,000 cubic yards of material over and above that included in the first estimates.

SLOPES WERE TOO STEEP

"In summary, then, the structural-break type of slide was due to oversteep slopes in places where the banks were high and the rocks weak. The remedy was to unload the unbalanced pressure and to reduce the slopes. The ends sought to be accomplished by the remedy were a reduction of the amount of excavation that otherwise would be necessary and non-interference with tracks, drainage, etc. The slopes stood at a much steeper angle before being disturbed than after they had been weakened by deformation.

"Though it is not impossible that a destructive earthquake might visit the canal, still it is extremely improbable. In summary, then, the following are the chief reasons why it is believed the canal will never be in any appreciable danger from earthquakes.

"The larger number of tremors detected every month by the recording instruments is evidence that slow adjustments are constantly taking place and thus that no great accumulations of stress that might later culminate in a big shock are probable.

"The absence from the isthmus region of high mountains and of geologically recent volcanic activity is evidence in favor of the probable absence of earthquakes, especially as such high mountains are a striking geologic feature of the whole Central American earthquake belt.

"The presence of numerous small faults and of the faulted conditions of such volcanic cores as Gold Hill and Contractors Hill is evidence that adjustment here has progressed well on toward normal conditions of equilibrium.

BIG QUAKE IMPROBABLE

"The tensile strength of the majority of the rocks within the Canal Zone is rather low, and they would shear with comparative ease, thus preventing any relatively great accumulation of stress that might result in a comparatively intense shock. However, experience teaches that where earthquakes happen the buildings suffering the maximum destructive effects are those built on loose and friable material. This consideration might therefore subtract a little from the saving benefits of the yielding and preventative qualities of the Canal Zone rocks.

"Over 300 years of earthquake observation shows only two shocks of considerable magnitude, and there is every reason to believe that the severest of these would not have seriously damaged even the most delicate parts of the canal.

"That many small and harmless shocks will traverse the Canal Zone is certain, but that the canal is in any real danger from earthquakes is contrary to all the evidence."

INCIDENT IN MINE EMPHASIZES NEED OF FIRST-AID TRAINING

While two fire runners were busy in No. 38 mine, Alderson, Okla., one of them, Ed. Gallimore, was overcome. His partner found him in a room unconscious, and immediately telephoned for the mine foreman, S. B. Reddell. Accompanied by the runner and one other man, Reddell went down the slope and into the room where Gallimore was lying. As the latter is a large man, weighing nearly 200 pounds, they had some trouble in handling him, but immediately applied artificial respiration, using the prone method. The patient's jaws were closed and set, so that it was difficult to pry them open.

The rescuers dragged Gallimore into the entry to a curtain where there was some fresh air, and laid him under this curtain while they continued to administer artificial respiration. After working about forty minutes, they got him out to the slope, and took him to the surface on the trip.

Doctors arrived shortly afterwards. By this time the patient was making an effort to breathe and was semi-conscious. The doctors directed that he be kept quiet, warm, and be given plenty of fresh air, and in an hour's time he began to struggle so violently that it was difficult to hold him.

The rescuers have been attending the first-aid classes recently organized at Alderson, and are members of the team recently organized from the No. 38 mine by J. W. Koster.

Superintendent P. W. Malloy stated that the prompt first-aid work rendered by these men undoubtedly saved Gallimore's life, and that the first-aid work had already shown its value to his company and to the employes.

STANFORD ALUMNI HONOR THEIR FORMER TEACHER

Dr. J. C. Branner, who resigned the presidency of Stanford University at the end of 1915 was in Washington at the beginning of February. Dr. Branner is a member of the Commission appointed to study the slides along the Panama Canal and on his way from Panama visited Jamaica. He was called to Washington to testify in the Congressional hearings on the California oil-lands.

Mrs. Branner accompanied Dr. Branner. A reception was given them by the Stanford Alumni of Washington at the home of Dr. and Mrs. George H. Ashley.

STOCKHOLDER SCORES OIL LEASING MANIPULATIONS

The following statement by Edward J. Holmes, of Boston, was made recently before the Senate Committee on Puclic Lands.

Mr. HOLMES. Mr. Chairman, I am a stockholder in the Boston-Pacific Oil Co. I have no authority to represent the company, or anybody but myself and a few stockholders, who feel as I do in regard to things. This company is a small one. Its claim is about 160 acres of land within the Maricopa district, Cal.

Senator Works. Has there been any disagreement among the stockholders about that, Mr. Holmes?

Mr. Holmes. Oh, no. I simply mean that those who live in Boston thought there ought to be some presentation of our case, and I said that I was willing to come here and present the case for them, and they said all right.

Our location was made on April 12, 1909, by bona fide locators, who immediately set to work and before President Taft's preliminary withdrawal order had built a substantial two-room house, dug a sump hole, and had lumber for a derrick hauled on to the land. One or two months before September 27, 1909, the date of the preliminary withdrawal order, they were compelled to stop work for lack of water and money. Water had to be pumped from a distance and required the installation of pumping machinery and pipes, involving so great an expense that it required a combination of several interests to finance it.

One locator lived in the house on the property continuously until after September 27, 1909, and I think until December 15, 1909, when all the locators sold their interests to J. M. McLeod, who then completed arrangements previously entered into for water, and started to develop the property. On March 15, 1910, we took a lease from McLeod, and were in diligent prosecution of the work before and at the time of the passage of the Pickett bill, June 25, 1910, and President Taft's second withdrawal order on July 2, 1910. We continued drilling diligently, and after spending all our money and going heavily into debt, and after various vicissitudes, we finally discovered the oil, at a depth of over half a mile below the surface, on June 8, 1912.

I wish to add that we are within the naval reserve, our property being on the extreme edge. We spent our money and discovered oil several months before we had any idea that our property was desired for the reserve. The well began to flow August 6, and was in good working order in November, 1912. As I understand it, no fault has been found with our work, but in the opinion of the Government authorities our predecessors in interest had not worked with sufficient continuity to entitle us to the relief given to some by the Pickett bill.

President Taft's executive order establishing the naval reserve was not issued until December 13, 1912, so that we had spent our money and discovered oil several months before we had any idea that our property was desired for the Navy. If our property were outside the naval reserve, we would be entitled to relief under the terms of H. R. 406. It seems to us that it is unfair that we should be deprived of this relief merely because our property happens to be just within the line of the territory covered by the naval-reserve order. When we were spending our money we could in no way have foreseen that such order would be issued, and that its issuance would mean that our property would be dealt with differently from neighboring property.

The Department of Justice has brought suit against us, has had a receiver appointed, and seeks to eject us from the property, to take the money in the bank, and to collect from the stockholders who have never received a dividend or a return of any kind from their investment, the value of all the oil heretofore produced.

Since April, 1914, some, and since February, 1915, all of the proceeds from the sales of our oil have been placed in escrow in banks of San Francisco to await a decision on our right to the property. There is now about $240,000 so placed.

Until we had invested upward of $50,000 we did not know of the first withdrawal order. When we were informed of it we believed, after such investigation as we could make, that the work done by our predecessors in interest would entitle the company to a patent, or at least a lease under what we supposed would be the proposed new legislation regarding public lands. The idea of a naval reserve had at that time never been even suggested, so far as we knew.

Senator Works. How much money had you expended, Mr. Holmes, before the naval-reserve order was made?

Mr. Holmes. All of it. After this time money began to come in.

Senator Works. Was that order made after you actually discovered oil?

Mr. Holmes. Oh, yes, sir; several months after. We discovered oil in June, and the well flowed at a very rapid rate, several thousand barrels a day, in August, and it was not until the following December that the naval reserve order was issued.

We were hard at work developing the property when the Pickett bill was passed, and when the naval reserve order was issued we had discovered oil and were producing from one well and drilling another. We did not dare to stop work at any time after we began lest we should be held to have abandoned the property and to have forfeited the right, which, until very recently, we believed we had, to a lease or a patent, and as a result we have felt it necessary to go ahead, and have done so at great expense. Now, because of the naval reserve order, which we could at no time have foreseen, it appears we are to be deprived of the relief which our neighbors, who have acted just as we have, and in no better faith than we have, are to be given.

There is another point which I want to mention, though not to unduly emphasize, because there is a decided difference of opinion on the subject—that is the distance which oil will flow underground. It is my firm belief that the naval reserve tract will, unless properly developed by or for the Navy Department, be drained

practically dry by wells on patented lands within or adjoining it. My reason for being of this opinion is based on our experience.

The K. T. & O. Co. has a well 400 feet from one of ours. It sanded up last November, and as a result thereof the pressure in and production from our well immediately began to increase. In three days the pressure increased from 120 pounds to 170 pounds, and our production increased 75 barrels a day, about a 15 per cent increase in production.

Prior to the K. T. & O. Co.'s wells sanding up the pressure of and production from our well had varied very little.

There really is not anything more to say, so far as the facts are concerned. The wells have been producing and the money has been going into escrow, and we are hoping to receive a patent which we feel that we ought to be entitled to. If, on the other hand, it should appear to be impossible for a patent or patents to be granted to a company situated as ours is, then the first section of the proposed amendment—I do not know how it should be described—would cover our case.

The provision in the original bill, I think, also covers our case—I mean, in so far as any lease can cover it—but it leaves the matter discretionary with the Secretary of the Interior, and I fear that if the Navy Department shall decide to oppose the granting of any leases within the naval reserve the comity existing between the departments would make it difficult for the Secretary of the Interior to grant a lease to us, unless it were made very clear that it was the intention of Congress that, in meritorious cases, leases within the naval reserve should be granted.

I understand that the Navy Department will oppose the granting of leases, because when we applied for a temporary lease, under the provisions of Senate bill 5673, of the Sixty-third Congress, which left the matter to the discretion of the Secretary of the Interior, we were informed that the Navy Department did not desire the Secretary of the Interior to grant any leases in the naval reserve, and the Secretary of the Interior did not feel at liberty to grant them in the face of that objection.

BOULDER COUNTY, COLORADO, GREAT FERBERITE PRODUCER

The term ferberite applies to that tungsten mineral which is composed almost wholly of iron tungstate. Wolframite is the iron manganese tungstate, and hübnerite the manganese tungstate.

The occurrence of all three minerals in the United States is very similar, but they do not ordinarily occur together, although a part of the ores mined in the Boulder County district, Colorado, which is the great ferberite bearing region of the world, approaches the composition of wolframite. There is, however, only a very small part of the Boulder County ores which should be called wolframite.

LARGE COMPANIES BEING ASSISTED BY METALLURGISTS

As an indication of how much the research work being conducted by the department of metallurgical research, of the University of Utah, in cooperation with the U. S Bureau of Mines, on flotation, cynidation, precipitation, treatment of zinc-lead complexes, oxidized zinc, lead leaching, and other problems of concern, is attracting attention of the mining industry, within the past few weeks, two of the largest mining and milling companies in Utah, and one in Idaho, have detailed technical men to work in the laboratories of the department. These men will avail themselves of the data which has been collected by the department as a result of its research work and which will assist them in the solution of the problems in which they are especially interested.

The addition of these three companies increases the number to eight who have representatives working on particular problems in the laboratories of the department at the present time. The number of mining companies and individuals who are availing themselves of the opportunities afforded by the department for carrying on work of this kind is a source of much satisfaction to those in charge of the work, as it demonstrates to them the value to the industries of the investigations in which they are at present engaged.

WINDSTORM PLAYS HAVOC IN THE PARADOX VALLEY

The camp at the mines in the Paradox Valley, Colo., where the Bureau of Mines is extracting radium ore, was damaged by a storm last month. In his report the superintendent said in part:

"A windstorm entirely demolished the warehouse, three of the seven bunk houses for the men, and the dining room. Only the floor of the warehouse remains; the canvas of the tents was ripped to shreds. The cook house was uninjured except for holes in the roof. Our own tent we saved by almost superhuman efforts. Allen placed heavy guy-lines of wire on the corners when the wind first began, the tent rocked so, and with every severe blast we threw our weight against the frame from the inside and kept it from caving in, though it rocked like a ship in a heavy sea. The sensation was not a pleasant one! The mill was uninjured, the storm coming from the south and southwest, from which sides it is sheltered. The din and uproar were terrifying and truly awful. Large trees snapped like toothpicks, broken limbs and timber were flying about and crashing around us, and in the inky darkness every sound was intensified and made more mysterious. Our tent was a sight, for everything that was up fell down and everything that was out fell in. We simply waited in the dark, pushing with all our might, but expecting it to cave in every moment."

Supreme Court Decisions

Further sustaining the income tax law, the Supreme Court, in construing the clause relating to incomes from mining companies, upheld the Government's contentions that profits taken from mines, even though reducing the actual physical value of the mines, are taxable.

John R. Stanton, a stockholder, had sought an injunction against the Baltic Mining Company to prevent its paying, "at the source," income taxes upon his gross profits. The decision in full follows:

As in Brushaber *vs.* Union Pacific Railroad Company, this case was commenced by the appellant as a stockholder of the Baltic Mining Company, the appellee, to enjoin the voluntary payment by the corporation and its officers of the tax assessed against it under the Income Tax section of the Tariff Act of October 3, 1913 (38 Stat. 166, 181). As the grounds for the equitable relief sought in this case so far as the question of jurisdiction is concerned are substantially the same as those which were relied upon in the Brushaber case, it follows that the ruling in that case upholding the power to dispose of that controversy is controlling here and we put that subject out of view.

Further also like the Brushaber case this is before us on a direct appeal prosecuted for the purpose of reviewing the action of the court below in dismissing on motion the bill for want of equity.

The bill averred: That, under and by virtue of the alleged authority contained in said Income Tax law, if valid and constitutional, the respondent company is taxable at the rate of 1 per cent upon its gross receipts from all sources, during the calendar year ending December 31, 1914, after deducting (1) its ordinary and necessary expenses paid within the year in the maintenance and operation of its business and properties and (2) all losses actually sustained within the year and not compensated by insurance or otherwise, including depreciation arising from depletion of its ore deposits to the limited extent of 5 per cent of the 'gross value at the mine of the output' during said year." It was further alleged that the company would if not restrained make a return for taxation conformably to the statute and would pay the tax upon the basis stated without protest and that to do so would result in depriving the complainant as a stockholder of rights secured by the Constitution of the United States as the tax which it was proposed to pay without protest was void for repugnancy to that Constitution. The bill contained many averments on the following subjects which may be divided into two generic classes: (A) Those concerning the operation of the law in question upon individuals generally and upon other than mining corporations and the discrimination against mining corporations which arose in favor of such other corporations and individuals by the legislation, as well as discrimination which the provisions of the act operated against mining corporations because of the separate and more unfavorable burden cast upon them by the statute than was placed upon other corporations and individuals— averments all of which were obviously made to support the subsequent charges which the bill contained as to the repugnancy of the law imposing the tax to the equal protection, due process and uniformity clauses of the Constitution. And (B) those dealing with the practical results on the company of the operation of the tax in question evidently alleged for the purpose of sustaining the charge which the bill made that the tax levied was not what was deemed to be the peculiar direct tax which the Sixteenth Amendment exceptionally authorized to be levied without apportionment and of the resulting repugnancy of the tax to the Constitution as a direct tax on property because of its ownership levied without conforming to the regulation of apportionment generally required by the Constitution as to such taxation.

We need not more particularly state the averments as to the various contentions in class (A), as their character will necessarily be made manifest by the statement of the legal propositions based on them which we shall hereafter have occasion to make. As to the averments concerning class (B), it suffices to say that it resulted from copious allegations in the bill as to the value of the ore body contained in the mine which the company worked and the total output for the year of the product of the mine after deducting the expenses as previously stated, that the 5 per cent deduction permitted by the statute was inadequate to allow for the depletion of the ore body and therefore the law to a large extent taxed not the mere profit arising from the operation of the mine, but taxed as income the yearly product which represented to a large extent the yearly depletion or exhaustion of the ore body from which during the year ore was taken. Indeed, the following alleged facts concerning the relation which the annual production bore to the exhaustion or diminution of the property in the ore bed must be taken as true for the purpose of reviewing the judgment sustaining the motion to dismiss the bill.

"That the real or actual yearly income derived by the respondent company from its business or property does not exceed $550,000. That, under the Income Tax, the said company is held taxable, in an average year, to the amount of approximately $1,150,000, the same being ascertained by deducting from its net receipts of $1,400,000 only a depreciation of $100,000 on its plant and a depletion of its ore supply limited by law to 5 per cent of the value of its annual gross receipts and amounting to $150,000;

whereas, in order properly to ascertain its actual income $750,000 per annum should be allowed to be deducted for such depletion, or five times the amount actually allowed."

Without attempting minutely to state every possible ground of attack which might be deduced from the averments of the bill, but in substance embracing every material grievance therein asserted and pressed in argument upon our attention in the elaborate briefs which have been submitted, we come to separately dispose of the legal propositions advanced in the bill and arguments concerning the two classes.

Class A. Under this the bill charged that the provisions of the statute "are unconstitutional and void under the Fifth Amendment, in that they deny to mining companies and their stockholders equal protection of the laws and deprive them of their property without due process of law," for the following reasons:

(1) Because all other individuals or corporations were given a right to deduct a fair and reasonable percentage for losses and depreciation of their capital and they were therefore not confined to the arbitrary 5 per cent fixed as the basis for deductions by mining corporations.

(2) Because by reason of the differences in the allowances which the statute permitted the tax levied was virtually a net income tax on other corporations and individuals and a gross income tax on mining corporations.

(3) Because the statute established a discriminating rule as to individuals and other corporations as against mining corporations on the subject of the method of the allowance for depreciations.

(4) Because the law permitted all individuals to deduct from their net income dividends received from corporations which had paid the tax on their incomes, and did not give the right to corporations to make such deductions from their income of dividends received from other corporations which had paid their income tax. This was illustrated by the averment that 99 per cent of the stock of the defendant company was owned by a holding company and that under the statute not only was the corporation obliged to pay the tax on its income, but so also was the holding company obliged to pay on the dividends paid it by the defendant company.

(5) Because of the discrimination resulting from the provision of the statute providing for a progressive increase of taxation or surtax as to individuals and not as to corporations.

(6) Because of the exemptions which the statute made of individual incomes below $4,000 and of incomes of labor organizations and various other exemptions which were set forth.

But it is apparent from the mere statement of these contentions that each and all of them were adversely disposed of by the decision in the Brushaber case and they all therefore may be put out of view.

Class B. Under this class these propositions are relied upon:

(1) That as the Sixteenth Amendment authorizes only an exceptional direct income tax without apportionment, to which the tax in question does not conform, it is therefore not within the authority of that Amendment.

(2) Not being within the authority of the Sixteenth Amendment the tax is therefore, within the ruling of Pollock *vs.* Farmers' Loan & Trust Company, 157 U. S. 429; 158 U. S. 601, a direct tax and void for want of compliance with the regulation of apportionment.

As the first proposition is plainly in conflict with the meaning of the Sixteenth Amendment as interpreted in the Brushaber case, it may also be put out of view. As to the second, while indeed it is distinct from the subjects considered in the Brushaber case to the extent that the particular tax which the statute levies on mining corporations here under consideration is distinct from the tax on corporations other than mining and on individuals which was disposed of in the Brushaber case, a brief analysis will serve to demonstrate that the distinction is one without a difference and therefore that the proposition is also foreclosed by the previous ruling. The contention is that as the tax here imposed is not on the net product but in a sense somewhat equivalent to a tax on the gross product of the working of the mine by the corporation, therefore the tax is not within the purview of the Sixteenth Amendment and consequently it must be treated as a direct tax on property because of its ownership and as such void for want of apportionment. But aside from the obvious error of the proposition intrinsically considered, it manifestly disregards the fact that by the previous ruling it was settled that the provisions of the Sixteenth Amendment conferred no new power of taxation but simply prohibited the previous complete and plenary power of income taxation possessed by Congress from the beginning from being taken out of the category of indirect taxation to which it inherently belonged and being placed in the category of direct taxation subject to apportionment by a consideration of the sources from which the income was derived, that is by testing the tax not by what it was—a tax on income, but by a mistaken theory deduced from the origin or source of the income taxed. Mark, of course, in saying this we are not here considering a tax not within the provisions of the Sixteenth Amendment, that is, one in which the regulation of apportionment or the rule of uniformity is wholly negligible because the tax is one entirely beyond the scope of the taxing power of Congress and where consequently no authority to impose a burden either direct or indirect exists. In other words, we are here dealing solely with the restriction imposed by the Sixteenth Amendment on the right to resort to the source whence an income is derived in a case where there is power to tax for the purpose of taking the income tax out of the class of indirect to which it generically belongs and putting it in the class of direct to which it would not otherwise belong in order to subject it to the regulation of apportionment. But it is said that although this be undoubtedly true as a general rule, the peculiarity of mining property and the exhaustion of the ore body which must result from working the mine, causes the tax in a case like this where an inadequate allowance by way of deduction is made for the exhaustion of the ore body to be in the nature of things a tax on property because

of its ownership and therefore subject to apportionment. Not to so hold, it is urged, is as to mining property but to say that mere form controls, thus rendering in substance the command of the Constitution that taxation directly on property because of its ownership be apportioned, wholly illusory or futile. But this merely asserts a right to take the taxation of mining corporations out of the rule established by the Sixteenth Amendment when there is no authority for so doing. It moreover rests upon the wholly fallacious assumption that looked at from the point of view of substance a tax on the product of a mine is necessarily in its essence and nature in every case a direct tax on property because of its ownership unless adequate allowance be made for the exhaustion of the ore body to result from working the mine. We say wholly fallacious assumption because independently of the effect of the operation of the Sixteenth Amendment it was settled in Stratton's Independence *vs.* Howbert, 231 U. S. 399, that such a tax is not a tax upon property as such because of its ownership, but a true excise levied on the results of the business of carrying on mining operations. (pp. 413 *et seq.*).

As it follows from what we have said that the contentions are in substance and effect controlled by the Brushaber case and in so far as this may not be the case are without merit, it results that for the reasons stated in the opinion in that case and those expressed in this, the judgment must be and it is affirmed.

GOVERNMENT EXPERT ENSNARED BY LURE OF THE ARCTIC

Sumner S. Smith has returned to Alaska. Two months enforced stay in Washington on official business was a hardship to him greater than hitting the trail under the northern lights in the depth of winter. The asphalt and cement pavements stove him up. The electric lights hurt his eyes. The buildings obscured his view. The rays of the sun were too nearly vertical. No blubber was served at the eating houses. So Sumner S. was about to pine away when Director Manning, of the Bureau of Mines arranged it so he could hurry back and be revived by the rays of the midnight sun.

Washington is fairly familiar with some types of returned Alaskans. Miners who strike it rich generally spend some of their time and money here. They seem to enjoy it until their money is gone, at least. Or it is possible that they may not sober up long enough to realize the disadvantages of being in the midst of civilization. Mr. Smith's case is different. He is a government expert looking after the division of coal lands into proper units. He does not drink. He gets as much salary when he is here as he does when he is bouncing from rock to rock on his dog-drawn sled. While it is inexplicable to his friends here there is no question that Mr. Smith is firmly in the toils of the lure of the Arctic.

WASHINGTON DELEGATION ENJOYS INSTITUTE MEETING

Washington members of the American Institute of Mining Engineers who attended the annual session of the Institute in New York last month, are enthusiastic over the generous manner in which they were entertained and the interest that marked the assemblage.

George Otis Smith, director of the Geological Survey, made this comment about the meetings:

"There was a large and enthusiastic attendance which indicates that the increased activities of the mineral industry are not detracting in any degree from the technical subjects which make up the basic material of the progress of the Institute.

"Preparedness, to a certain extent, was the keynote of the meeting. It is gratifying to those interested in the mineral industry to observe the new appreciation of the extent to which the nation must depend upon this resource whether it be in times of peace or those of war."

MINE MANAGER SAVES $50,000 ON HIS EXPLOSIVES

In an article on "Explosives in Engineering," Charles E. Munroe, of the Bureau of Mines, says:

"A study was made of bore-holes in blasting operations by Clarence Hall and W. O. Snelling. Their results and conclusions were published as Technical Paper No. 17 of the Bureau of Mines under the title, 'The Effect of Stemming on the Efficiency of Explosives.' It was naturally of interest to learn that a manager of a considerable mine reported a saving of $50,000 in his explosives account in a single year by following the methods for using stemming taught by this research."

COAL PRODUCTION SLACKENS; OPEN WINTER CHIEF CAUSE

Coal production, which started out the first of the year at a tremendous rate, is dropping off considerably, according to figures being received by the Geological Survey. This is due largely to the weather conditions. The open winter has resulted in a considerable decrease in the amount of domestic coal used. The freight embargoes on the railroads also have had a decided influence in working the havoc which has overtaken the coal market. The railroads of the United States use twenty-five per cent of the coal production, while domestic consumers use another twenty-five per cent. The remaining fifty per cent is consumed in coke manufacturing, gas making, at factory and industrial plants, in smithing, and for exports.

Mineral Paints to Cost More

Prices on paints are going up, due to the increase in the demand for crude zinc and led whites. Zinc white particularly has not been affected by the general increase in price until very recently.

Current Federal Legislation

Thus far 16,927 bills have been introduced in Congress, of which 4,653 have been introduced in the Senate and 12,274 in the House of Representatives. Of these 561 were introduced in the Senate and 1,704 in the House during the month of February.

Of the bills referred to in our last issue, H. R. 153 is still under consideration by the Senate Committee on Education and Labor, and it is believed will be so amended by the committee as to prevent entirely the possibility of duplication of safety investigations in mining operations.

H. R. 406 is still before the Senate Committee on Public Lands. A considerable number of hearings have been held, at which the principal appearances have been on behalf of the oil operators. In another column will be found the statement of Edward J. Holmes, of Boston, Mass., which is typical of many of the statements which have been made. It is anticipated that the bill will be reported from the committee early in March.

H. R. 408 is upon the Senate Calendar waiting consideration.

SENATE BILLS

S. 4447, by Mr. Walsh, provides for an appropriation of $10,000,000, $1,000,000 to be spent each year for ten years for the construction of roads within or partly within the national forests, the expenditure in each state being limited to ten per cent of the probable income from the national forests within the county or counties in which such roads are constructed. Such expenditure is to be made in cooperation with the State, Territory or County upon some equitable basis to be approved by the Secretary of Agriculture.

S. J. Res. 100, by Mr. Lane, requires the Secretary of the Interior to adopt a royalty system in place of bonus and royalty system now in effect for the sale of leases on the oil lands of the Osage Indians in Oklahoma.

HOUSE BILLS

H. R. 6780, by Mr. Kahn, provides for the location and entry under the placer mining laws of the United States of lands containing deposits of asbestos.

H. R. 9687, by Mr. Small, provides for the exemption from compulsory pilotage barges in tow of steam vessels navigated by government pilots. Numerous hearings have been held by the Committee on Merchant Marine and Fisheries. A favorable report upon this bill is expected and its enactment will relieve coal carrying barges entering ports upon the payment of pilot charges required by state laws.

H. R. 10585, by Mr. Rainey, provides for the creation of a United States Tariff Commission to consist of five members who shall be allowed appointed by the President, not more than three of whom shall be members of the same political party. It shall be the duty of the commission to investigate the administration and fiscal effects of custom laws of this country now in force or to be hereafter enacted; the relations between the rates of duty on raw materials and finished products and the advantage and effects of the custom tariff laws and their relation to federal revenue. The Commission is also empowered to investigate commercial treaties and all matters relating to unfair competition of foreign industries. It is also provided that the Commission shall act in cooperation with the Treasury Department, Department of Commerce and the Federal Trade Commission, and that these departments shall cooperate with the commission.

H. R. 10830, by Mr. Foster, provides that all fuel purchased by the government shall be upon the recommendation of the Bureau of Mines, except the fuel for the Navy, and that the Bureau of Mines shall be charged with the further duty of recommending plans for the installation of fuel burning equipment and to investigate the methods of purchase and means of handling storage and using of fuel for the use of the government. Seventy-five thousand dollars is to be appropriated to carry out the provisions of this act.

H. R. 11073, by Mr. Church, provides for the leasing by the Interior Department of any lands within the limits of any Indian Reservation in the State of Claifornia for mining purposes, including oil, coal, asphalt, and other minerals. The Secretary of the Interior is directed to provide rules for the leasing of such lands, but the bill provides that leases shall be made to correspond in extent of area to the present mining laws of the United States except that no lease shall be made to cover more than 640 acres. The bill further provides that lessees pay for such land $100 per annum for the first and second years, $200 for the third and fourth years, and $500 per annum for each succeeding year, as advance royalty, such payments to be made in advance.

H. R. 11162, by Mr. Taylor, of Colorado, provides that incorporated cities and towns shall have the right to purchase from the government public lands not reserved for other use, not exceeding one-quarter section, for cemetery or sewerage purposes; not exceeding 640 acres for the protection of its water supply and not exceeding 640 acres for public park purposes. The bill provides that the lands shall revert to the Federal Government in case the town or city shall fail to use same for the purposes granted.

H. R. 11258, by Mr. Taylor, of Colorado, provides for the sale of 250,000 acres of non-irrigable, non-mineral, or non-timber lands in each

of the public land states, the area not exceeding 320 acres to one person, ten per cent of the purchase price to be paid at the time of sale, and the balance in ten annual installments. Each purchaser is required within five years to cultivate one-half of the area purchases, to develop a water supply and to spend at least $1,000 in improvements. One-half of the money so paid is to be set aside for a public road within the limits of the state.

H. R. 11712, by Mr. Hayden, provides for the establishment of game sanctuaries in national forests.

H. R. 12040, by Mr. Kent, provides for the classification of public lands of the United States, according to the principal value or use of the surface thereof, and that all patents hereafter issued shall expressly reserve all deposits of phosphate, oil, asphaltum, natural gas, coal, lignite or associated minerals.

BUREAU OF MINES LOSES APPARATUS IN FIRE

In the destruction of Morse Hall at Cornell University by fire, all the apparatus of the Bureau of Mines, which was used in the extensive experimentation in progress there, was destroyed.

Only one room of the hall escaped danger. This contained the electric generators. Due to the fact that this apparatus was not damaged it will be possible for a considerable portion of the cooperative work of the Bureau of Mines there to be continued.

Another fortunate incident of the fire was the fact that H. W. Gillette, the alloy chemist of the Bureau of Mines, stationed at Cornell, had duplicates of all of his records. The original records were destroyed in the fire, but it has been the practice of Mr. Gillette to send a duplicate record of each month's work to Dr. Parsons, head of the Division of Mining Technology.

SOAPSTONE OUTPUT INCREASES; VIRGINIA LARGEST PRODUCER

As to soapstone, Virginia is the greatest producer. It is of a fine quality, and the output applies to a very large market throughout the United States.

New England, the former chief source of supply, is still producing a great deal of soapstone, but most of that trade in recent years has gone to Virginia. The production of this increased decidedly during 1915.

The great bulk of soapstone used goes into the manufacturing of laundry tubs. A considerable quantity is used in making tables for chemicals, photographic and other laboratories where acids are employed. Formerly the supply in New England was used in making stoves and this practice continues to a rather surprising extent.

An increasing quantity of soapstone is used for plates in fireless cookers.

RUSSIA MAY LIFT HER EXPORT TAX ON PLATINUM

Platinum continues to be almost unobtainable at any price in the United States. Hope is expressed in well informed quarters that the high Russian export tariff may be raised. This tariff was ordered before the war with the idea that it would lead to the refining of raw platinum in Russia. Quite contrary to some published statements, it was not a result of the war.

As the war seems to preclude the erection of any refineries at present, and owing to the large stocks of platinum held by Russian branches, it is considered very probable that the export tax will be removed and allow the sale of the stocks now on hand. Russian bankers have been furnishing money to the extent of 80 per cent of the value of the raw platinum.

Some suggest that Russia may be holding this platinum to insure an ample supply for her allies, and to be certain of preventing its reaching her enemies.

So far as is known here the gold and platinum miners in Russia are still exempt from military service. The price of platinum has increased 50 per cent. With the assurance of such good prices and an abundance of labor, it is expected that much new ground is being opened there.

A new American producer is expected to come in this year. It is the Rambler mine in Wyoming. Improved concentrating machinery is being established on this property which is located in Laramie County.

GRAPHITE INDUSTRY BADLY UPSET BY THE WAR

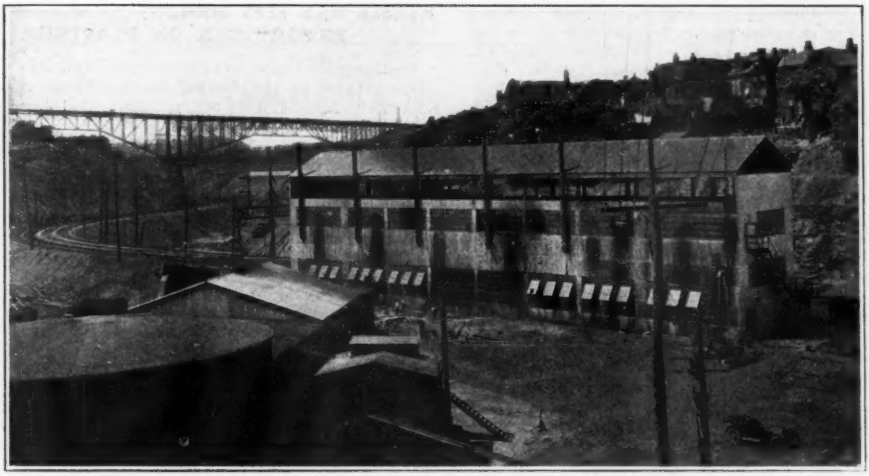
No industry has been stirred more deeply by the war than has the distribution of graphite, according to E. S. Bastin, of the United States Survey.

Most of the world's graphite, previous to the war, came from Ceylon. This source of supply has been interferred with largely. The demand for graphite in this country has been extremely heavy since the opening of the war. This has stimulated the mining of graphite in this country and Mexico.

Mexico, for a number of years, has been furnishing practically all of the pencil graphite used in the world. The cutting off of this supply has caused Germany and Austria to reopen Baravian and Bohemian deposits.

CORRESPONDENT POINTS OUT AN INJUSTICE

The following letter has reached Washington: "I hope that Congress will deal liberally with the Bureau of Mines. I understand its appropriation last year just equaled the amount appropriated by Congress for investigations in the treatment of hog cholera."



WHERE RITTMAN IS WORKING

In this plant at Pittsburgh the Bureau of Mines, in connection with the Aetna Chemical Company, is conducting experiments of international interest

BUREAU OF MINES GIVES OUT DETAILS OF RITTMAN PROCESS

The Bureau of Mines has just published Bulletin 114, dealing with the manufacture of gasoline and benzene-toluene by means of the processes devised by Dr. Walter F. Rittman, chemical engineer of the Bureau. The bulletin gives the data for the laboratory experiments which resulted in the discovery of the processes, and also gives a detailed description of the plant and equipment developed for the operation of the processes on a commercial scale.

The growing difficulty in meeting the demand for motor fuels from the existing supplies of crude oils by ordinary refining methods has led to a great deal of experimentation with a view to increasing these yields by processes involving the cracking of heavy oils into lighter and lower boiling oils.

The Rittman processes differ from the great majority of prior processes. The oil to be treated is introduced in small quantities into the top of a vertical tube which is highly heated by means of the combustion of natural gas, fuel oil, or any other suitable fuel. The oil is fed in slowly so as to cause it to be instantaneously gasified. The gases so produced are then superheated or cracked and the products of the cracking reaction withdrawn from the lower portion of the tube, and condensed in the usual way. The advantages claimed for this method of treatment are: the hydrocarbon material is fully expanded so that if there is a leakage of joints or a giving way of the container no danger results; much higher temperatures and pressures can be used with greater safety than in liquid vapor processes; the speed of reaction incident to high temperatures can be readily attained; the control conditions can be varied at will.

BENEFITS OF FIRST-AID TRAINING POINTED OUT

Washington Times.

A convention of medical experts held in Washington last summer has borne fruit in the appointment, by President Wilson, of a board of first aid standardization. At the time of the convention figures were presented which indicated a surprising loss of limb and life in industrial and transportation work because of a lack of knowledge of first aid measures among those who ought to have such knowledge.

A principal factor in retarding the dissemination of such knowledge was that physicians themselves have been in dispute about proper first-aid packages to be made available to industrial workers and railroad men. Too often these laymen have been equipped with material only the trained physicians could apply.

The standardization board is to work out a satisfactory first-aid package to be placed in the hands of laymen, and another to be used by physicians. In view of the industrial accidents in this country, such an effort is more of a boon than might seem at first sight.

This training will be of marked benefit if this country ever is called upon to go to war. European nations have learned that field hospitals service and relief of the wounded are matters of primary inportance. Training large numbers of physicians and laymen in the art of applying first-aid measures will be of inestimable value in time of stress.

Employs 446 Persons

At the close of 1915 there were 446 persons on duty in the Bureau of Mines.

AGRICULTURAL POSSIBILITIES OF ALASKA SET FORTH IN GOVERNMENT REPORT

Opportunities for Farming Shown to Exist in Many Parts of Northern Territory—Susitna Region Offers Specially Favorable Sites

A reconnoissance soil survey of a vast area in Alaska to investigate the agricultural possibilities of that territory has recently been made, and the results of this work will shortly be published in a report by the Bureau of Soils of the United States Department of Agriculture. The report comprises 202 pages and contains thirty-eight page plates and four maps. It describes the climate, soils, crops, and other conditions bearing upon the possibilities of agricultural development in Alaska, and in addition discusses such incidental subjects as settlement, natural resources, physiography, drainage, means of communication, and a comparison of Alaska with parts of Siberia and Finland.

Mining in Alaska will be facilitated greatly by the growth of agriculture.

The report says in part:

"The existence of a vast mountainous area along the southern coast of Alaska, with numerous lofty, snow-covered peaks and huge glaciers, necessarily unfit for human habitation, is apt to give one unfamiliar with the complexities of the topography and climate of the country as a whole the impression that Alaska is a region of inhospitable mountains, glaciers, and snow, without farming possibilities. In a measure this is true, for there are in the territory immense areas of rugged mountains, including the loftiest peakes upon the North American continent, the great wastes of snow-clad and precipitous land, wide stretches of bleak tundra and mountain skirting the Arctic Ocean, innumerable bodies of water-soaked Muskeg, and many glaciers of almost incredible magnitude. Nevertheless there are millions of acres of relatively low, smooth land and gentle slopes in various parts of the country which are topographically and climatically suited to farming. That this is true is not a matter of conjecture, for many valuable food products both for man and animal are now being successfully grown. Farming in a region so far north may seem astonishing until one is acquainted with the equable summer climate, the long hours of summer daylight, and the good quality of the soil."

PIONEER CONDITIONS PREVAIL

It is pointed out, however, that while the development of a successful agriculture throughout an enormous area in Alaska is possible, it must be remembered that "as yet strictly pioneer conditions obtain, that settlement is largely confined to communities in the vicinity of mining camps, that much of the country is inaccessible owing to the absence of roads and railroads, and that home markets are restricted by the present small population."

"Every indication is that agricultural development must be gradual, must grow with the construction of highways and railways, with the development of mining industries and accompanying increase of population. If large numbers, without sufficient capital, should 'stampede' to these lands with the idea of immediately establishing profitable farms for themselves, it is believed that there would be only disappointment for many. A careful study of the conditions before undertaking farming operations here is therefore urgently advised. The prospects of success for farming depend, so far as sale of surplus products is concerned, upon finding a local market among a population attracted by mining resources and fisheries. In other words, these regions of Alaska will probably not for some time export agricultural products, at least not on an important scale. Exportation of such products must await the building of a system of railways and highways and probably, also, the establishment of cheaper transportation."

The report deals with three general areas, the Cook Inlet-Susitna region, the Yukon-Tanana region, and the Copper River regions.

COOK INLET-SUSITNA REGION

The most important is the Cook Inlet-Susitna region, the agricultural lands of which are comprised, says the report "in the plainlike country and adjacent beach lands bordering Cook Inlet from Kachemak Bay northward and extending up the Susitna and Matanuska Valleys. The unfavorable climate and topography of the surrounding mountainous country restricts the farming possibilities to this low country, the approximate area of which is 6,000 square miles. At least one-third of this area, amounting to a little more than a million and a quarter acres (1,296,000 acres, the lowest estimate), consists of arable land possessing topographic and drainage characteristics and chemical and physical properties quite favorable to farming. About one-half of this good land occurs in the Susitna and Matanuska Valleys.

"The climate and soil make possible the establishment of an important agriculture in the Cook Inlet-Susitna Region. Development will follow along pioneer lines at first, leading

eventually to the establishment of many comfortable homes, supported largely by the products of the farm. The possibilities of raising stock and dairying point to the furtherance of agriculture, eventually, to a position of importance considerable beyond a self-supporting stage. The building of a railroad through the Susitna and Matanuska valleys will make accessible a large area of good farming land, and, unquestionably, settlement will follow, probably at a rapid rate. Already 150 homesteads have been registered along Knick Arm, and others have been taken up. A number of prospectors and miners, most of whom previously have not been identified with agriculture, are now supporting themselves in the neighborhood of Knick largely with the products of their farms, assisted by the earnings of a few days' outside work during the summer."

YUKON-TANANA REGION

"The Yukon-Tanana region comprises (1) the lowlands of the lower Tanana River, from the vicinity of McCarty to the Yukon River, known as the Tanana Flats; (2) the lowlands of the Yukon River, chiefly comprised in the Yukon Flats; and (3) the area of highlands or hill country between the Tanana and Yukon lowlands, the Yukon-Tanana uplands. In discussing the area as defined above, it is not meant that this includes all of the agricultural land of interior Alaska. This is simply the area to which the investigations were specifically directed. Farming lands are reported to exist in considerable areas along the upper Tanana River, and good grazing is said to be available about the headwaters of White River, in the Mentasta Pass section and in other places outside the limits of the area described.

"On the soils of the Tanana bottoms good crops of vegetables and grain hay are produced. Immense quantities of hay and good grazing can be derived from the native grasses which thrive on these soils. In addition, large quantities of grain hay and root-crop forage can be easily grown.

"In the hills north of the Tanana bottoms is found the best soil seen in Alaska. This is a deep, mellow silt loam (Fairbanks silt loam) having good drainage and moisture-holding capacity. It occurs on the lower slopes, and is largely susceptible of easy cultivation. There are approximately a half million acres of this valuable soil. This type of soil is the same as that at the Fairbanks experiment station, where such good results have been had with grains and potatoes. On the southward-facing slopes it yields over 200 bushels of potatoes per acre, without fertilization. Early varieties of oats and barley mature in normal years. Wheat and rye also have matured at the Rampart and Fairbanks stations. All varieties of grain give good yields of hay on this soil, even in years of early frost. Turnips, cabbage, beets, carrots, lettuce, celery, and several other vegetables are grown with unusual success, both as regards quality and yield. Native redtop grass springs up quickly immediately following the removal of timber.

"There are still larger areas of other cultivable soils on the slopes of the hill country. These are not so deep as the Fairbanks silt loam, but they produce good crops of excellent potatoes, various vegetables, grain, and grass. Probably 1,500,000 acres of such land exists in the country between the Tanana and Yukon Rivers. Other soils of agricultural possibilities are found in the bottoms of the small streams and on the bench lands of the region."

COPPER RIVER REGIONS

The Copper River regions are the Copper River Basin and the Copper River Delta. "The Copper River Basin, or Copper River Plateau, is a broad expanse of plainlike country almost completely inclosed by mountains. It is bordered on the north by the Alaska Range, on the west by the Talkeetna Mountains, on the south by the Chugach Mountains, and on the east by the Wrangell Mountains."

The Copper River Delta occurs where "Copper River enters the Pacific Ocean a short distance northwest of Controller Bay, through a labyrinth of channels, dividing and reuniting to form an interminable network of passages, 'sloughs,' with almost countless intervening islands and bars. The low, flat delta through which these numerous distributaries flow is somewhat triangular in shape; with its apex 30 miles inland, between the fronts of Childs and Miles Glaciers. There is a large extent of country in the upper Copper River Basin, northward from the vicinity of Copper Center, which has a quite favorable topography for agricultural operations. The principal soil here, however, is not so favorable, being predominantly of a clayey character, and so stiff and probably cold-natured that it would be difficult to till and crops likely would be slow to reach maturity on it. Heavy teams and tools would be required to work such land. Furthermore, the climate of the region appears to be not so favorable as that of either the Cook Inlet-Susitna or the Yukon-Tanana regions. Vegetables and grain hay, however, are being successfully grown on the bottom-land soils and the more loamy types of the uplands. Some cattle have been raised at various places in the region along the Valdez-Fairbanks road. Stock raising and dairying would likely be found the most remunerative types of farming.

"Practically the entire delta is unsuited to agriculture, owing to the poor drainage, the liability to disastrous floods, and the inferior character of the soil. Near the glacier fronts the glacial plains, covered with freshly discharged glacial débris, are mostly bare of vegetation, but farther away there is much alder and scrub willow and a variety of water-loving grasses."

DECREASE IN MINE ACCIDENTS FOLLOWS U. S. SAFETY WORK

In the year 1907 the first appropriation was made by Congress for "conducting such investigations as would increase safety and efficiency in mining operations." For several years prior there had been a steady increase in mining accidents of approximately 25 per cent annually. The following tabular statement tells a story of which all the friends of the movement should feel proud:

Year	*Production (short tons)*	*Employed*	*Killed*	*Rate, per 1000 employed*	*Killed, per million tons*
1907	480,363,424	680,492	3,242	4.81	6.78
1908	415,842,698	690,438	2,445	3.60	5.97
1909	460,814,616	666,552	2,642	3.96	5.73
1910	501,596,378	725,030	2,821	3.89	5.62
1911	496,371,126	728,348	2,656	3.65	5.35
1912	534,466,580	722,662	2,419	3.35	4.53
1913	570,048,125	747,644	2,785	3.73	4.89
1914	513,525,477	763,185	2,454	3.22	4.78
1915[1]	518,000,000[2]	767,553[1]	2,264	2.95	4.37

[1] Subject to change. [2] Estimated by U. S. Geological Survey.

NEW USES ARE INCREASING THE DEMAND FOR ALUMINUM

One needs only to glance at the increasing consumption of aluminum to get an idea of its increasing use. The variety and extent of its possible uses may be inferred from a consideration of its properties. Its specific gravity is only 2.6 to 2.7 as compared with water taken as 1, while that of steel is 7.7 and that of brass more than 8. It possesses malleability, ductility, and considerable tensile strength. It alloys fairly easily with other metals and strongly resists the influence of iron, water, and vegetable acids. For these reasons it is being used on an increasing scale in making kitchen utensils, surgical appliances, jewelry, and fancy articles, and bearings for machinery. This information is from W. C. Phalen of the United States Geological Survey. He says further:

"Another use, relatively unexploited, is in the decoration of interiors; that is, in supplanting wood in modern business offices. About the only articles that are still made of wood in the modern office are the desks and chairs, and it is more than likely that these soon will be supplanted by metal in response to the requirements of fireproof construction and furnishings. Painted sheet steel is now a favorite material for interior construction, but aluminum will probably be found quite as satisfactory.

"Aluminum is now used in ways which do not attract very much attention, but in which large quantities of the metal are consumed—for example, the manufacture of novelties.

"Powdered metal, known as aluminum bronze powder, is used in painting, printing, and lithographing, as a constituent of explosives and as a patented source of heat. A very modern use is as a casing for explosives. Aluminum foil, which has hitherto been largely imported, is now manufactured here and is meeting with considerable success. Perhaps one of the greatest advances made in 1914 has been in the quality of the aluminum sheet manufactured in the United States. Aluminum sheet has a tendency to blister and to show other surface defects, but special efforts have been made to study the cause and remedies of these defects. These efforts have been so far successful that the sheet on the market today is of very superior quality.

"An investigation has been made concerning the influence of aluminum on Bessemer ingots and rails when added to the molds during the pouring of the steel. The work was done at the South Chicago works of the Illinois Steel Co., which furnished the material. Five ingots were of untreated Bessemer steel; eight were treated with aluminum varying from 1 to 10 ounces per ton of steel, and two of these ingots were treated with additions of ferrosilicon, equivalent to one-tenth and two-tenths of 1 per cent of silicon, respectively. These latter were rolled into rails. In summing up the benefits resulting from the addition of aluminum, Wickhorst says:

"'Ingots treated with aluminum added to the mold were of more even composition throughout than plain Bessemer steel. There was less positive segregation in the interior and upper parts of the ingot, but the negative segregation or soft center in the interior and lower parts of the ingot was about the same. There was a softening or negative segregation in the upper part of the wall of the plain ingot, while in the aluminum treated ingots the walls were of fairly even composition throughout the height of the ingot. The aluminum treated ingots had larger and deeper pipes than the plain steel, but had denser steel around the pipes.

"'Rails of plain steel had a brittle zone in the upper part of the bar, as disclosed by the drop test. In the rails of the aluminum-treated steel this zone was largely eliminated. Rails of plain steel contained their laminations close to the top end of the bar, while

in aluminum-treated rails the interior laminations were found a considerable distance from the top end, varying from about 30 to 45 per cent of the weight of the ingot. In the transverse test of the base, rails of aluminum-treated steel showed a considerably greater transverse strength of the base and sag of the flange before breaking than the rails of plain steel with 0.61 per cent carbon and little greater strength and sag of flange (than rails) with 0.45 per cent of carbon.'

"In a pamphlet issued late in 1913 by the British Aluminum Co. (Ltd.), a very complete and frank statement is given of the advantages and limitations of the metal aluminum in construction on a large scale. When aluminum first began to assume considerable industrial importance, two disadvantages militated against its rapid extensions: First, the initial capital expenditure, and second, constructional difficulties in any but the smallest vessels. According to the information contained in the pamphlet, the difficulty of high first cost has been annulled by a considerable reduction in the cost per ton in recent years, made possible by improved and extended manufacturing facilities. In this connection, the fact should not be lost sight of that the upkeep charge is low on the metal, which is especially free from corrosion, heavy handling, and frequent scouring.

"The temporary setback, due to constructional difficulties, has been effectively met by the introduction of the process of autogenous welding. The soldering of aluminum in a chemical plant is and has been unsatisfactory. It has at all times been a difficult and unreliable process, as it has introduced alloys of a different composition in the electro-chemical scale which have set up galvanic action with the resulting evils of electrolysis and subsequent corrosion. Aluminum does not lend itself to riveting, as its malleable nature and low yield points are serious obstacles to a sound and lasting joint where extremes of temperature and vibration are likely to be encountered; but by the process of welding, referred to above, aluminum vessels of any size or shape can now be made from the metal in its purest sheet form. It is stated that aluminum is suitable for practically all purposes in the chemical plant, provided it is not brought into contact with hydrochloric acid, halogen solutions, or caustic alkalies.

"The better known branches of the chemical industry, in which aluminum vessels of large size are in use, are in the brewing industry; in the manufacture of varnish; in the preparation of foodstuffs, such as sirups, essences, and jams; in the refining of sugar; in the preparation of edible oils and fats, and of such fatty or vegetable acids as oleic, stearic, and palmitic acids. It is also used by the soap and candle manufacturers; in certain branches of the explosive industry; in the construction of certain parts of the dye-works plant; and to an increasing extent in the production of hydrogen peroxide and formaldehyde, citric acid, and glycerine, and a host of less-known chemicals.

NEW YORK CONTINUES TO FURNISH BULK OF TALC

Talc, as heretofore has come very largely from the great mines at Gouveneur, N. Y., which for many years produced more talc than all the rest of the United States combined. This talc is of a fibrous character. This is due to its being derived by alteration from fibrous hornblend. This gives it a fibrous structure that makes it specially valuable in the manufacture of paper.

The production of talc is increasing in many places, but more especially in New England. Vermont is producing much larger quantities. North Carolina, Georgia and California also are producing considerably more than during previous years.

Forms Publications Committee

In order to give force and effect to the policy to be followed regarding the printing of all articles and papers by members of the Bureau of Mines, and to insure greater efficiency in the handling of such papers, a publication committee has been formed within the bureau to pass on all matter to be published.

Colorado Metal Mining Association

The annual meeting of the Colorado Metal Mining Association was held at Denver, February 12. The following officers were elected: President, Bulkeley Wells; First Vice-President, T. R. Henehen; Second Vice-President, George M. Taylor; Third Vice-President, George Argall; Secretary, M. B. Tomblin; Treasurer, A. M. Collins.

REVISION OF MINING LAWS SUBJECT OF NEW BILL

Modification of the apex law, new regulations for locating claims and tunnels sites are provided in a bill introduced in the House of Representatives by the chairman of the Committee on Mines and Mining, Dr. Martin D. Foster.

A tentative print of the bill only has been made. Dr. Foster declares that his measure is intended simply as a base on which to work. Consideration of it will begin as soon as the matters before Congress will permit of committee meetings. Little hope is held out for the passage of the measure at this session but Dr. Foster hopes to be able to have the bill in such shape, after the changes have been embodied which will be suggested, as to make it possible to pass it at the next session.

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EDITORIALS

A LESSON FROM THE COLORADO COAL STRIKE

It is very gratifying to find one federal committee appointed to investigate labor conditions reporting favorably. This may signify either that conditions are improving and are so far improved as to justify such favorable report, or that the committee referred to is more willing to do justice to the situation than some of its predecessors.

In either case the change is gratifying. It perhaps never can be said of any large body of workmen that all are living under the best possible conditions, but it should always be true that all those who are industrious and frugal are able to do so.

It is understood that the report of the committee sent by President Wilson to examine the Colorado situation is to the effect that conditions in the southern Colorado field, brought so sharply to public attention by the Ludlow horror, compare favorably and to advantage with any similar coal mining section in the country.

Perhaps in no previous industrial war has the public accepted so freely the criticisms of the employers and perhaps in none has this criticism carried more of injustice. The fact that the Rockefellers were largely interested in one of the Colorado companies involved in the strike furnishes ample excuse for many, heretofore believed to be above such contemptible pettifogging, to misrepresent the whole situation in order to make political capital by appeals to the masses, based on a misstatement of the facts.

Some, perhaps much, good has come from the bitter sacrifices made by both sides of the controversy. The lesson has been well learned that direct association between employer and employe is of mutual advantage, and that the bitter criticisms of one side of any controversy should not be accepted until all the facts are available.

Conditions in Colorado were not all they should have been, are not now, and probably never will be. When a coal mining camp with its usual mixture of foreigners, not speaking the English or any common language and but slightly acquainted with our political institutions, can reach model conditions most other communities will have qualified for the millennium and Gabriel's trumpet will put an end to the need of coal production.

Each side must learn toleration—each side must respect and obey the law. Intolerance frequently brings and sometimes justifies a resort to strikes; violations of the law sometimes bring and always deserve punishment. A strike conducted without violations of the law is a just weapon in the hand of labor. To take from labor this inherent right is to concede its right to demand employment. The right to work or refuse to work is as inherent as the right to employ or discharge. These are rights which must go hand in hand. To deny either is to deny the fundamental principle of freedom. The independence of the American workman is so fundamentally important that any violation of the principles which support it must be opposed with vehemence. In the end it will be found that the best results for both jointly can only be secured through the most perfect cooperation and that the rights of both sides can best be established without violation of the rules which protect society.

THE LEASING BILLS

The Senate Committee on Public Lands is now considering H. R. 406, entitled "an Act to authorize exploration for and disposal of coal, phosphate, oil, gas, potassium or sodium," Various statements on behalf of the oil land claimants, representing millions of dollars of invested capital have been made.

These statements while objecting, in a general way to the 'proposed leasing system, have been directed toward convincing the committee that some relief should be granted to the oil claimants which would afford protection to their investments.

The statement of Mr. Holmes, of Boston, appearing elsewhere in this issue, is typical and its perusal will convince any fair minded man that justice requires relief. Had it not been for Mr. Holmes' investment in a western enterprise it is probable that he too would have been one of the many who give approval to the radical changes which are being made in the public lands system of the United States.

The great development of oil production in the western States has been of untold advantage to the country as a whole. The larger part of this development would never have been made had it been anticipated that the Federal Government would undertake to establish a new system of land control, through which the legitimate investments of individuals would be endangered.

It is urged that the country's need for oil for defensive purposes justifies the reservation of sufficient oil to supply the possible Government needs. The MINING CONGRESS JOURNAL is convinced that undeveloped oil fields would be of little use to the country in time of peril. Without the development carried on by private individuals, willing to take enormous chances in the hope of securing extraordinary profits the oil reserves would be entirely unknown.

Surely there should be no question but that a beneficent Government will care for the interests of its citizens whose investments were made in good faith and under authority of then existing law. Anything short of this will be a rank injustice to the individuals who suffer and a lasting shame to the Government.

BUREAU OF MINES DOES NATION ANOTHER GOOD TURN

Another asset has been added to the nation's list by the Bureau of Mines. Through its experiments it has been possible to develop a kaolin of the highest quality in the United States. For the first time in the history of the country it is independent of other nations for this important mineral product as abundant American material can now be procured and substituted for English china clay.

Each individual doubtless has turned over a plate or a saucer and seeing "Austria," "France" or "Great Britain" stamped on the back has asked why more dishes are not made in America. Perhaps there would not have been so much curiosity aroused if these marks appeared on fine china only but much of the cheapest ware bears the same ear marks. Much white ware is now made in this country but largely from imported kaolin; as a result of the latest accomplishment of the Bureau of Mines it may be expected very soon that "Made in America from all American material" will begin to appear on the backs of our table ware.

Dishes, however, represent only a small portion of the kaolin that is consumed. Many thousand tons have been imported for use in the making of ornamental tiles and for sundry purposes.

Incidentally this work adds to the indebtedness of the American people to Dr. Chas. L. Parsons, the head of the division of mineral technology of the Bureau of Mines, under whose direction the work was done. Ira E. Sproat, the chemist who was in charge of the actual work, is a young man to whom much credit is due. Dr. Parsons in trying to side-step any of the credit for the achievement, is attributing much of it to Mr. Sproat. There also are the manufacturers who cooperated in giving the newly refined material practical tryouts. Dr. Parsons also speaks highly of the part they took in making the country independent of foreign kaolin.

MINING ENJOYS LITTLE PRESTIGE IN WASHINGTON

When Senator McCumber introduced his resolution calling on the Secretary of the Interior for detailed information regarding the production, consumption and price of gasoline, it is probable that he expected an exposé of manipulation, on which responsibility could be fastened for the recent increase in the price of gasoline.

Instead of some wily trick on the part of the "oil barons" it develops that the most natural thing in the world has happened. The demand has exceeded the supply.

Despite the conclusive nature of Mr. Lane's report there is still some tendency at the Capitol to believe that the figures have been juggled and that there is an enormous surplus of gasoline being carried, which is being fed out to the people at exorbitant prices.

While the oil miners have more influence in Washington than has any other class of mine operators, they have woefully few champions among the legislators. Why is it that there are no references to corn "barons," wheat "barons" and cotton "barons?" They have too many friends ready to champion them. Nothing suits the average lawmaker better than an opportunity to defend the farmer.

Of course there are no agricultural "barons" just as there are no mining "barons" or no lumber "barons." To call big operators in the latter two industries "barons" is done carelessly in Washington because there are few in Congress to spring up to defend the operators of these industries. Agricultural operators have plenty of champions; in fact nearly every legislator is their champion.

We have discussed many times why agriculture has such preferential treatment by the government. Understand, we think it deserves all it gets, but we feel aggrieved that mining should not have the same recognition.

There is just one way to secure the recognition which the federal government owes the mining industry and that is for every man interested in the industry to make up his deficiency in numbers by close cooperative effort. At this session of Congress the House Committee on Mines and Mining refused the request of an industry that produces nearly as much new wealth as does agriculture. This would not have happened had the 90,000 mining men of the nation been in a position to express its resentment.

There is just one way in which the mining industry can put a stop to the unjust discrimination to which it is being subjected. The mine operators of the country must get together in one big organization, or a number of closely affiliated organizations, and command the respect of Congress and every other agency of the people by the united front that they present. It is to the interest of capital and labor alike to aid in any movement that will add something to the very little prestige that the mining industry enjoys at Washington.

HONORABLE SURRENDER

"I am unalterably opposed to the whole principle of Federal leasing of mineral lands but in my present dilemma I am ready to consent to any plan which will protect the interests of the stockholders who have invested their money on my advice and who stand to lose their whole investment and much beside unless some relief is granted. I would crawl on my belly and kiss their feet to protect investments based on confidence in my judgment and integrity."

These are the words of a prominent oil man who is urging his Government not to so change the rules in the middle of the game as to rob investors of the legitimate profits of risky enterprises made under the protection of then existing laws.

The oil operators of California whose successful operations should make them most independent are ready to surrender. It took Great Britain a much longer time to convince the Colonies—but Great Britain was not as powerful in the days of King George as is the United States today.

DR. BRANNER HELD IN HIGH ESTEEM

Few university teachers or presidents have left a stronger personal impression on their students or have gained such thorough respect from their students than has Dr. J. C. Branner, recently of Stanford, who was the guest of honor here last month at a reception given by the Alumni of Stanford in Washington. His resignation from the presidency of that university was accepted only when he had remained a year after he had asked to be relieved from duty, and then only upon his insistence that it should be accepted.

He is succeeded as head of the Depart of Geology by Dr. Bailey Willis, formerly of the United States Geological Survey, and as president of the university by Dr. Ray L. Wilbur, an alumnus of Stanford, who has been head of the Medical School, both of whom are very able men.

SAFETY-FIRST WEEK A GREAT SUCCESS

Safety-first week proved a great success. The exhibition held in Washington under Government auspices has done much to encourage and spread the movement. The mining industry, of course, was the pivot of interest around which the rest revolved. The idea originated in the Bureau of Mines.

The gathering of the mine inspectors from practically every State in the Union has had splendid results. It is certain to result in standardization and cooperation that has been lacking. The nation will profit by this convention and this exhibition.

In the February issue we urged that Safety-First Week be made a permanent proposition. This view has met with much favor. The chances are that each year's progress in safety-first work will be brought to the attention of the public through an exhibition. That the exhibits were of interest is indicated by the fact that 35,477 persons inspected them. While the publicity division of the Bureau of Mines did splendid work and secured more space than it would have been thought possible in this day of big news, yet the exposition was not systematically advertised. It was a sort of informal affair gotten up on short notice but even than it was a great success. It could have been much better and next year it probably will more nearly represent the work that the Government is doing to reduce fatalities and casualties.

The Bureau of Mines nationalized the slogan "safety-first." It is the originator of safety-first week, which will popularize still further the safety-first movement.

The American Mining Congress would like to make another suggestion. Why not load on a train the exhibits that were shown last month at the National Museum and haul them around the country and let more of the people see what the Government is doing in this work? This seems to us a practical proposition and we shall lose no opportunity of bringing it to the attention of those in authority.

EFFICIENCY AND CONSERVATION

The strength of a nation is fairly well measured by the use which it makes of its mineral products. The inventive genius of man in cooperation with capital by the consumption of coal has made it possible for one man's labor to accomplish more than one hundred men could have accomplished by primitive methods. By the utilization of these forces the luxuries of the past have become the necessities of today. Living conditions which were entirely beyond the reach of the crowned heads of a century ago are available for the working men of today.

The greater the efficiency in production, transportation and exchange the greater the luxuries which may be afforded by all of the people. The highest statesmanship is that which after providing stable government shall stimulate increased efficiency and make its advantage accrue to all of the people. Low-cost to the consumer requires efficient production and the prevention of waste.

The relation of labor and capital while subject to the laws of evolution, should adapt themselves with the least possible friction, to those conditions which promote efficiency and conservation.

DOES TRADE FOLLOW THE FLAG?

At no previous time in our history have so many comprehensive efforts been in progress by the business interests of America to control foreign trade. Particular efforts look to the control of the trade of Latin America. Under present conditions highly successful temporary results may be confidently expected. The benefits thus secured will not be permanent except through the highest efficiency of the productive forces of the country.

It seems evident that the close of the European war will be followed by a most strenuous competition. Impoverished Europe will face financial obligations requiring the utmost thrift and economy at home and the sale of its product in foreign markets. The cost of this product at home will be at the minimum and to meet the prices at which it will be offered in competitive markets will tax the ingenuity of American producers whose chief cost of production is based on the American wage scale. Much of the present effort is based upon the questionable premise that "Trade follows the flag."

Trade does not follow the flag unless supported by efficiency and pushed by enterprise. Demand is created by enterprise and filled by efficiency. The flag is the emblem of government representing order, without which trade comes to an end. The desire for gain—the business mainspring of the world—is ever seeking that point where articles of trade can be most cheaply purchased, and markets where they can be sold to the best advantage. Cheapness of production—efficiency—calls to itself the buyers of the world.

THE FEDERAL LEASING POLICY

In 1885 gold was discovered in the frozen stream beds of the Yukon. Its recovery required the using of a large amount of fuel. Wood fuel was comparatively scarce and expensive. Coal was abundant. No law of the United States provided for the utilization of Alaska's coal reserves. The appeals of Alaska induced Congress to undertake legislation to make her coal resources available. Laws were passed in 1900, 1904, 1908 and 1914 intended by Congress to meet the situation. Three of these laws have been abandoned as unworkable and the fourth has been in effect since August, 1914, but no coal has been mined under its provisions. Alaska's industries are contributing millions of dollars annually to the Nation's wealth and purchasing coal from Canada and oil from southern California. Her own oil and coal are locked up by the icy hand of ignorant control animated by the best impulses of a great and generous nation which has temporarily forgotten that the constitution of the United States was only made possible through the recognition, in a broad and comprehensive way, of the principles of home rule. That same nation inspired by the same theories and shutting its eyes to the foundation principle of the constitution, is now engaged in the enactment of similar laws for leasing the coal, oil and water power of the western States.

To the extent that these laws meet the demands of the theorists, who do not understand western conditions, will they be unworkable. Appeals and protests have been made to Congress by the West through the legislatures of the several States, through its Chambers of Commerce and its various public organizations.

It seems probable that the leasing bills will be enacted by the present session of Congress. It seems equally probable that future years will demonstrate the impracticability of the leasing policy as applied to the development of resources situated more than 2,000 miles from the seat of Government.

BETTER JUDGMENT SHOWN BY CONGRESS

Abundant evidence of more than the usual judgment in appropriating is being displayed by this Congress. In allowing $100,000 to the Geological Survey in the urgent deficiency bill for preliminary expenses for Alaskan work it has made possible an economic and efficient use of the appropriation. It enables the Survey to perfect its plans in time to get supplies into the interior before the spring break-up.

SAFETY-FIRST EXHIBITION PRAISED BY PRESIDENT

(Continued from page 112)

different from the iron mines in Michigan; and on the other hand some of the methods adopted in Michigan have been adopted in some of the precious metal mining in the West. The method of mining is the important factor. The best you can do is an approximation."

TAKES EXCEPTION

Mr. Donovan then declared:

"It appears to me that the main object of this meeting is to discuss the saving of human lives and not the insurance rate that we are going to charge them. What we want to do is to save a man's life so that he can be of some service to his community. With all due regard to your insurance rate, we want to keep these miners at work, because after all it is a question of how that man can with safety to himself and to others get that pound of coal up without killing himself or somebody else. We should keep in mind the main point at issue and that is when a good looking miner goes underground you want him to look just as good when he comes out. As I have stated before, if we have one or two more years of the war, one of those miners will be worth six or seven dollars a day because we will have a hard time finding men enough to operate our mines. The element of life is the one for us to talk about."

Mr. Wilson takes a very different view of this question and said in reply:

"I do not think that the last speaker intends to convey the implication which he does convey, because he knows too much about insurance. We are all after the very thing which he is speaking about, the conservation of life. He knows that insurance companies are interested financially in saving life, so that is too trite to discuss. It is naturally unnecessary that each of us discuss a subject like this from the standpoint of our own individual business. The Chairman made the suggestion just now that we do not want to lay down any rules and that we should have a discussion which may result in reference of these subjects to a committee. I think that last suggestion an admirable one. There is no question, however, that we should debate rather freely or we will not have anything for that committee to consider. I make the suggestion, therefore, that at an appropriate time a resolution be brought forward authorizing the chairman to appoint a committee consisting of the various interests concerned in saving lives in mines to consider and pass upon the acts of this meeting and embody its subsequent resolutions in the report. Meantime, however, and for the guidance of that committee, I believe that it would be well for us so far as we can to follow the course which Mr. Fay outlined."

QUESTION OF ACCURACY

With regard to securing greater accuracy in statistics an interesting discussion resulted. Mr. Fay introduced the matter as follows:

"The matter of reporting the number of men employed is far from uniform and is far from accurate. The number of men reported employed are entirely too large. It is an easy matter to run over the payrolls and say that 25 men were on the payroll this month, but all the men did not work full time. On the forms which we are sending out now, collecting information for year 1915 the question has been inserted asking for the number of hours of labor for which wages were paid as shown by the payrolls. In other words, they should turn in to us, if they are employing 1,000 men for 8 hours a day, 8,000 hours a day. They know exactly how many shifts they have paid for and how many hours a man has worked. Many companies have records to show the number of hours for which they have paid wages. If they will give us this information these columns (showing number of 8, 9 and 10 hour shifts, and men so employed) here are not necessary. This is another way of getting at approximately the number of hours that the men were working and it is better than simply calling for the number of men employed."

COLORADO PRACTICE

Mr. Dalrymple, of Colorado, said: "We get out a bulletin in Colorado along these lines. Every month the operators report. We get the number of days worked by each man, the number of men employed and the number of tons produced. We carry on the totals to the end of the year and then divide it by twelve. I think this is as accurate as you can get it. During the summer months and spring months they very seldom work more than four hours a day hoisting coal. As to whether the company reports the number of days or the number of hours for an 8-hour day that has been working in hoisting, whether they give the number of hours that have been worked by the miner I am not in a position to say. I can say, however, that no matter how you get this record it will be approximate at best.

Mr. Hall, of Pennsylvania, said:

"A peculiar condition exists in Pennsylvania. Two miners may work together. Their business is to blast down coal. They divide the day pay. The two men go into the mine in the morning and one man may work for an hour blasting coal, but each gets the same pay. One man may get a day's pay for a half-hour's work."

Mr. Bohlander, of Illinois, said:

"I wish to say that, as far as Illinios is concerned in coal mining, the hour basis would be almost an impossibility. We pay so much per ton. The men work when they please; they go in when they please and come out when they please. The mines have a number of openings and if you wanted to get the correct time you would have to have a steel trap at every opening. We have an eight-hour law but very few of the men work the full eight hours."

J. W. Paul, who is very familiar with conditions in West Virginia, said:

"With a view of determining whether or not the nationality and prior experience of men of

foreign birth who worked in the mines and their lack of knowledge of the English language have anything to do with the percentage of accidents in mines, we adopted a table. It does not seem to have been very uniformly followed up by the other State inspection departments. Had this been done there might be made some comparison in the different States. I believe Pennsylvania has taken up a similar classification in recent years. We have frequently heard in public speeches and from persons making efforts to have legislation adopted, the statement that the large number of accidents is due to the fact that the foreigner who works in our mines cannot speak the English language.

"I doubt very much if this is as true as some people seem to think it is. This table was suggested with the view of securing data which would be of service in the formulating of additional rules and regulations and the securing of legislation. West Virginia has been carrying this table along from year to year. I think, however, it would be well for some committee to take this and revise the classification of the nationality of employes. I think that these names were adopted and copies largely from the reports sent in by the operators in which the proper classification of the nationalities from the various countries have not been fully complied with."

In this connection Mr. Atkinson said:

"For a number of years I was in the mine inspection service in West Virginia. I know how hard it was in the early days to get any information from the operators. I also am perfectly familiar with the fact that Mr. Paul (and I say this with all respect to his predecessor) was the first man who attempted to put the mine inspection work of West Virginia on any real business basis. In regard to nationalities. It has always been a question with me as to whether the ignorant foreigner is always the one who gets hurt. In my experience, which has been practically limited, I find that the experienced miner will take more chances and will do more foolhardy things than any other man that we have around the mine. An ignorant and green foreigner goes into the mine with an experienced foreigner who takes good care of him. So far as the tables are concerned I know that Mr. Fay is more familiar with them than most any person you could possibly get."

FOREMEN DISCRIMINATE

T. P. Wangler said:

"I do not know how many times I have walked into a room with the mine foreman or into an entry without noticing that when he would speak to an English-speaking man, he spoke to him in a very respectful sort of way. But if he would encounter a foreigner of any one of the Slavic race, for instance, his tone and manner would completely change, so much that I was struck. Many times I felt that he was not giving the foreigner the right kind of deal. I have actually seen, many, many times, a foreman miner leave an English-speaking miner working under a distinct hazard for the simple reason that he was timid about asking him to take precautions. All through West Virginia, the average English-speaking miner will give you a cussing out if you say too much to him about setting up a post, etc. I at one time went into a colliery in the middle west following up a mine explosion which had occurred some years before. I inquired of one of the miners about the cause of it. 'Well,' the fellow said, 'the cause of it was simply this. In this gangway we had about 12 men working. There were two brothers, English speaking, and the others were all foreigners. One of the brothers in carrying his timber up the breast became angered and aggrevated because he had to use a small Davy safety lamp. He hurt himself in some way or other, and in his anger broke the safety lamp over the timber, igniting the gas and killing eleven men. His brother was the only one saved.' The point is that the foreigner in a coal mine is obedient. He will listen to his superior, but the American thinks he is smarter than the other fellow and he will not listen.

RESOLUTIONS

Resolutions were adopted as follows:

1. The Committee recommends the acceptance of Form 7 (Form for reporting total number of men employed and of accidents in the mineral industry during a calendar year), as printed except that distinction should be made between the various kinds of metal mines, as copper, iron, lead and zinc, gold and silver, and between anthracite and bituminous mines. In the case of quarries, distinction should be made between the principal building stones, such as bluestone, granite, marble, sandstone, etc.

2. That the Committee recommends the adoption of Forms Nos. 8 (Form for reporting fatalities during a calendar year inside and outside of the coal mines, metal mines, and quarries), and 9 (Form for reporting nonfatal injuries during a calendar year at coal mines, metal mines, and quarries), with the addition of one column to show whether or not the injured person could understand English, and that the last column marked, "inside or outside," be replaced with the words, "where the accident occurred."

3. That the Committee recommends that Forms Nos. 10 (Form for reporting number of men employed inside and outside of coal mines, by occupation), and 11 (Form for reporting coal mine fatalities according to cause and occupation), be adopted with the addition of a column in each table showing the additional occupation, namely, "shot firer." That in Table 10, the columns relating to the "length of shift" be omitted, inasmuch as it seems apparent that reliable information of this character will be difficult to obtain.

4. That the Committee recommends that Forms 12 (Form for reporting number and class of all employes inside and outside of all mines except coal mines), and 13 (Form for reporting metal mine fatalities according to cause and occupation), be adopted, except that in Form 12, the columns relating to the number of hours worked per day be omitted.

5. That the Committee recommends that Form 14 (Form for reporting fatalities in or about coal or metal mines, quarries, and metal-

lurgical plants according to length of experience of injured employes), be omitted, inasmuch, as it will be difficult, if not impossible, to secure reliable information relating thereto. Data showing whether or not the injured person can understand English will be given in Tables Nos. 8 and 9.

6. That the Committee recommends that the definition of a fatal accident be that which terminates in death as a result of the injury regardless of time elapsed.

7. That the Committee recommends the adoption of Forms Nos. 1 (Form for a State directory of mines), and 2 (Form for reporting power equipment of mines, quarries, and metallurgical plants), as printed. That form 1 include one column showing dip of bed.

8. That the Committee recommends the adoption of Forms Nos. 4 (Form for reporting number and kind of mining machines in coal mines, kind and quantity of explosives used, and quantity of coal produced by various kinds of mining), and 5 (Form for reporting mining and ventilating equipment and explosives used in metal mines, with the exception that under Form 5, kind of opening be shown as shaft and tunnel with depth or length.

9. That the Committee recommends that Form No. 3 (Form for reporting ventilating equipment of coal mines), be referred again to the convention for general discussion.

10. The Committee on Resolutions recommends that the question of determining the number of men actually employed be given consideration by the final committee. Further, that it being almost impossible to secure data relating to the number of hours worked, that the number of men employed be based upon the total actual man shifts for which wages were paid during the year, or as an alternative that an average obtained from the pay rolls showing the actual number of men at work on a certain day each month throughout the year be taken as representing the number employed. That accident rates be calculated on a basis of 300 day workers.

11. That the Committee recommends that a committee of 7 be appointed to consider the foregoing resolutions in conjunction with the stenographic report of this conference, and be instructed to prepare for publication the proceedings of this meeting. This committee is to consist of 2 representatives of the coal mining industry, 2 representatives of the metal mining industry, 2 representatives of State compensation commissions, and one representative from the Bureau of Mines.

LIST OF DELEGATES

Delegates attending the conference of mine inspectors and representatives of industrial accident commissions were: J. T. Beard, Associate Editor, *Coal Age*, New York; Robt. N. Bell, State Mine Inspector, Boise, Idaho; John Bohlander, President, State Mining Board, Pekin, Ill.; G. H. Bolin, State Mine Inspector, Phoenix, Ariz.; Ed. Boyle, Chief Inspector of Mines, McAlester, Okla.; J. F. Callbreath; W. L. Chandler, National Safety Council, Mishawaka, Ind.; F. S. Crum, Prudential Insurance Co., Newark, N. J.; Jas. Dalrymple, State Coal Mine Inspector, Denver, Colo.; Thos. H. Devlin, Chairman, Illinois Mine Rescue Commission, Assumption, Ill.; A. W. Donovan, Chairman, Massachusetts State Board of Labor and Industry, No. 1 Beacon Street, Boston, Mass.; Otto Ellerman, State Mine Inspector, Lead, S. D.; Chas. Enzian, Mining Engineer, Philadelphia & Reading Coal and Iron Co., Pottsville, Pa.; Albert H. Fay, Mining Engineer, Washington, D. C.; Frank Hall, Deputy Chief, State Department of Mines, Harrisburg, Pa.; R. Dawson Hall, Associate Editor, *Coal Age*, New York, N. Y.; L. W. Hatch, Chief Statistician, New York State Industrial Commission, Albany, N. Y.; L. M. Jones, Mining Engineer, Pittsburgh, Pa.; W. W. Jones, Chief Mine Inspector, Albany, N. Y.; P. J. McBride, Bureau of Chemistry, Topeka, Kan.; H. D. McCaskey, Geological Survey, Washington, D. C.; Wm. Maloney, Territorial Mine Inspector, Nome, Alaska; Van. H. Manning, Director, Bureau of Mines, Washington, D. C.; G. F. Mickelbacher, Workmen's Compensation Service Bureau, White Plains, N. Y.; A. Munson, Dover, N. J.; W. B. Orem, State Metal-Mine Inspector, Helena, Mont.; J. W. Paul, Mine Inspectors Institute, Pittsburgh, Pa.; J. E. Pettit, State Coal-Mine Inspector, Salt Lake City; D. J. Price, Bureau of Chemistry, Washington, D. C.; R. T. Rhys, Coal Mine Inspector, District No. 2, Ottumwa, Iowa; Geo. S. Rice, Chief Mining Engineer, Washington, D. C.; W. W. Risdon, State Mine Inspector, Albuquerque, N. M.; I. M. Rubinow, Chief Statistician, Ocean Accident and Guarantee Corp., Ltd., New York, N. Y.; J. J. Rutledge, Mining Engineer, McAlester, Okla.; W. D. Ryan, Mine Safety Commissioner, Kansas City; M. L. Shipman, Commissioner, Labor & Printing, Raleigh, N. C.; Geo. O. Smith, Director, United States Geological Survey, Washington, D. C.; Sumner S. Smith, United States Mine Inspector for Alaska, Juneau, Alaska; Ex-Lieut. Gov. A. E. Spriggs, Chairman, State Industrial Accident Board, Helena, Mont.; Ed. Sweeney, Coal Mine Inspector, District No. 3, Des Moines, Iowa; W. H. Tolman, Director, American Museum of Safety, New York, N. Y.; C. H. Verrill, Bureau of Labor Statistics, Washington, D. C.; Thos. P. Wangler, Travelers Insurance Co., Columbus, Ohio, H. M. Wilson, Director, Department of Inspection and Safety Associated Companies, Pittsburgh, Pa.; H. M. Wolflin Industrial Accident Board of California, San Francisco.

Current Traffic Developments

In the important case of the Mitchell Coal & Coke Company *vs.* Pennsylvania Railroad Company, the Interstate Commerce Commission held:

1. The service over private tracks from the mines and coke ovens of shippers to the rails of the carrier is neither compelled nor prohibited by statute or at common law; but whichever course the carrier pursues the statutory inhibition of unjust discrimination and unreasonable preference or advantage must be observed.

2. When the carrier employs a shipper to perform this service for it, if the compensation is excessive, the shipper obtains an unreasonable preference and advantage in violation of the regulation statute.

3. The allowance paid by the defendant here to the competitors of the complainant was unreasonable and unlawful to the extent that it exceeded 8 cents per ton.

The Mitchell Coal & Coke Company, here complainant, owned and operated several mines and collieries on the line of the defendant in the Clearfield district. Its Gallitzin colliery, the one directly involved in this proceeding, was located approximately one mile from the main line of the defendant. Although the practice of paying allowances to shippers for services performed by them, between their operations and the defendant carrier's rails, was in effect prior to the year 1890, it is alleged that the officers of the complainant had no knowledge of that fact until 1898. Before the period of the action and until 1899 the defendant carrier moved the coals of the complainant from the Gallitzin colliery to its main line. Being informed that competing coal companies were performing the service for themselves and were receiving from the defendant carrier 10 cents per ton therefor, the complainant, in October, 1899, and for the sole purpose of receiving a similar allowance, installed a locomotive at its Gallitzin mine, and thereafter continued to perform all the service incident to moving the loaded and empty cars between its mine and the main line junction. The defendant, however, declined to pay allowances on the ground that it was itself prepared to perform the service, although, because of operating conditions, it could not do so economically at the Altoona, Glen White, and Milwood mines. An offer by the complainant to perform the service for 5 cents per ton was likewise declined, the evidence showed.

Dismiss Reeves' Complaint

In the case of the Reeves Coal Company *vs.* Chicago, Milwaukee & St. Paul Railway Company in which the defendant failed properly to advise complainant as to the route traversed by coal from Roosevelt, Tenn., to Dell Rapids, S. Dak., and defendant's subsequent failure strictly to observe the terms of complainant's reconsigning order, the Commission held it not to be a violation of the act to regulate commerce. The complaint was dismissed.

EFFECTS OF WAR ON MINERALS SUBJECT OF COMPARISON

Both metallic and nonmetallic minerals and both crude and manufactured products, exports and imports are affected by the war. The exports of petroleum and petroleum products for 1914 were over $100,000,000, and those of the metals—iron, manganese, copper, zinc, lead, radium, and others—were correspondingly large.

On the other hand the imports, comprising potash salts, barytes, magnesite, ceramic materials, and many other mineral substances, derived mostly from the European countries now at war, are normally very large. With these supplies cut off or much reduced by the war, it is to the development of our domestic reserves or raw materials, heretofore chiefly obtained from foreign sources, that attention is being chiefly directed, in general with excellent prospects of permanent economic and commercial benefit. For instance, since the outbreak of the war the demand for certain metals for making munitions has greatly raised the prices of those metals with the reault that many deposits of these metals hitherto dormant have become active producers. For example, the price of antimony has advanced from 6 cents to more than 40 cents per pound, that of mercury from $46 to $200 or more per flask, that of platinum from $37 to $100 or more per ounce, and that of tungsten ores from $6 to $60 or more per unit (20 pounds of tungsten trioxide.) The same is true of the prices of other commodities. For example, the price of sulphuric acid, which substance is also used in making munitions, has advanced to a higher point than ever before in history.

These comparisons were made recently by F. C. Schrader, of the U. S. Geological Survey.

C. WILLARD HAYES, GEOLOGIST, DIES IN WASHINGTON

C. Willard Hayes, one of the best known geologists of the United States, died in Washington, February 8, a victim of cancer.

He was chief geologist of the United States Geological Survey from 1907 to 1911. He resigned to accept a position with the Aguila Oil Company, of Mexico. Much of the time since he left the Survey has been spent in the Pampico oil fields.

Recent Legal Decisions

IOWA COMPENSATION ACT

The workmen's compensation act of Iowa (Acts of 35th General Assembly, Chap. 147) takes from the employer, if he accepts the provisions of the act, the following defenses: (1) That the employe assumed the risks inherent in, or incident to, or arising out of the employment; (2) that the employer assumed the risks arising from the failure of the employer to provide and maintain a reasonably safe place for the employe to work; (3) that the employe assumed the risks arising from the failure of the employer to furnish reasonably safe tools and appliances; (4) that the employer exercised reasonable care in selecting reasonably competent employes; and (5) that the injury was caused by the negligence of a fellow servant or coemploye.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1040, November, 1915.

DEFENSES AVAILABLE TO EMPLOYER

The provision of the Iowa workmen's compensation act to the affect that wilful negligence of an employe, with intent to cause his own injury, or negligence on his part due to intoxication, remain defenses, deals with cases where both master and servant are or may be in varying degrees to blame and limits the defense that the employer is not liable because the employe contributed to his own injury, to contribution by wilful self-infliction or by negligence due to drunkenness; but the fact that the two specified acts of negligence on the part of the employe remain a defense does not prevent an employer from showing that, whoever else was to blame or whoever contributed, or whatever the mental attitude or condition of the contributor may have been, the employer himself was in no manner to blame. Such a provision settles how far the negligence of the employee remains available as a defense, but does not touch the question whether the freedom of the employer from all blame remains a defense.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1041, November, 1915.

EFFECT ON RIGHT TO CONTRACT

The Iowa workmen's compensation act as applied to mining and other corporations prohibits any contract, rule or regulation that shall operate to relieve an employer from any liability created by the act, except as the act itself provides; and it makes any device by which the employe is to pay an insurance premium against the compensation provided in the act null and void, and permits no wages to be withheld for the purpose of paying premiums, and prevents an employe from waiving any provisions of the act if the statutory compensation is thereby lessened. But another section provides that the fixed amount of compensation cannot be reduced by contribution from employes. These are, however, in essence, guards against contracts to reduce liability for negligence and instead of being an invasion of the right of contract, they are precautions against allowing an employer to first accept the act and then avoid it by subterfuge, and thus what is taken away is not the right to bargain, but the right, by deviousness, to break the bargain made, and aside from this the right to contract is not infringed by the provisions aimed to insure compliance with contracts entered into.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1049, November, 1915.

CONTRIBUTORY NEGLIGENCE

In an action under the Iowa workmen's compensation act by a miner for injuries alleged to have resulted from the negligence of the mine operator, the mine operator may plead and prove contributory negligence of the injured miner by way of mitigation of damages.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1069, November, 1915.

RIGHT TO DEFEND

The Iowa workmen's compensation act does not prevent a coal mine operator, in an action against it by a miner for injuries due to the alleged negligence of the operator, from defending on the ground that the operator was in no wise at fault for the alleged injury charged to it.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1069, November, 1915.

INDUCING MINER TO REJECT BENEFIT OF STATUTE—EFFECT

Section 3 of the Iowa workmen's compensation act provides that if by or on behalf of the employer any request, suggestion, or demand was made that an employe, or a person seeking employment, shall exercise his right to reject the act, there shall arise a conclusive presumption that such employe or applicant was unduly influenced to exercise this right and that the rejection made under such circumstances shall be conclusively presumed to have been procured through fraud and be null and void.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1050, November, 1915.

CONSTITUTIONALITY OF STATUTE

A mining corporation is not a "citizen" within the protection of the "privileges and immunities' " provisions of the federal constitution, and such a corporation cannot question the constitutionality of a workmen's compensation act on the ground that it effects a wrongful breachment of the privileges and immunities of citizenship.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1067, November, 1915.

DEFENSE ABOLISHED

It is within the power of a legislature to eliminate by statute the various defenses resting risks assumed by an employe on the ground that these rules have been evolved by the courts and may properly be abrogated by the legislature.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1066, November, 1915.

MINERS' COMPENSATION ACT

A law known as a miners' compensation act is held valid though it provides a summary method for the disposition of claims filed under the law, and such an act is not unconstitutional as conferring judicial power on the State officer having charge and oversight of its administration.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1061, November, 1915.

See Cunningham *vs.* Northwestern Improvement Co., 44 Montana, 180, 119, Pacific, 554.

CLASSIFICATION AS TO MINING

The workmen's compensation act of Iowa is not unconstitutional on the ground of class legislation and because it applies to coal mining and excepts from its operation domestic servants, farm or other laborers engaged in agricultural pursuits, and persons whose employment is of a casual nature, and those engaged in clerical labor, as the differentiation between coal mining, and some or all of such excepted persons, is not arbitrary but natural and justified, and strict equality is neither necessary nor practically obtainable; and accordingly the act is not subject to the charge of class legislation.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1052, November, 1915.

REGULATING COAL MINING

The legislature of a State has power to pass laws regulating an extra hazardous business, such as coal mining, and to provide for benefits in case of injury or death, upon the ground that it involves an intention to reduce economic waste, to obviate breaches and dissensions between employers and employes, raise the standard of citizenship, lower the general burden of taxation, to promote peace, order and morals, as well as upon the ground that such an act is the proper exercise of the police power.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1051, November, 1915.

See Cunningham *vs.* Northwestern Improvement Co., 44 Montana, 180, 119, Pacific, 554.

LIMITING POWER TO CONTRACT

A statute preventing miners employed at quantity rates from contracting for wages upon the basis of screened coal, instead of the weight of the coal as originally produced in the mine, is not invalid and unconstitutional because it limits or deprives persons of the right to contract.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1051, November, 1915.

RIGHT TO QUESTION VALIDITY

An attack upon the constitutionality of the Iowa workmen's compensation law by a mine operator will not be justified or permitted on the ground that it may be so construed as to invade private rights secured by the constitution, unless such mining corporation shows that in the case it presents the effect of applying the statute is to deprive it of a constitutional right. But if acceptance of the act is elective then the claim of its invading constitutional rights will fail.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1048, November, 1915.

In an action against a coal mine operator for the death of a miner caused by the fall of rock from the roof of the mine, it becomes a question of fact to be determined by the jury trying the case whether the proximate cause of the miner's death was due to the negligence of the mine operator or whether the mine was operated by an independent contractor, and for whose negligence the mine operator was not responsible, where the evidence shows a written lease from the mine owner by which the mine was leased to a third person named to be operated by him, but where the evidence shows also that the mine operator issued checks to the miners in his own name in payment for labor and that such checks were good in the purchase of merchandise at the commissaries of the mine operator and that the mine operator deducted from the miners' wages certain insurance premiums as shown by the records of the timekeeper of the mine operator, and that the checks for time and wages were turned in at the office of the mine operator and the money was paid thereon by the operator, and that the mine was in fact owned by the defendant operator, and that the mules and cars used for hauling coal belonged to the operator and that the alleged lessee had

before that time been employed by and worked for the mine operator, though at the time of the alleged injury he had an office next to the office of the mine operator, where the time of the miners was turned in and kept, and that the miners went directly from such office to that of the mine operator and got checks in payment for time employed or labor performed.

Amerson *vs.* Corona Coal & Iron Co. (Alabama), 69 Southern, 601; June, 1915.

PRESUMPTION AS TO NEGLIGENCE

The workmen's compensation act of Iowa provides that in case of injury to an employee it shall be presumed: (1) That the injury was the direct result and grew out of the negligence of the employer; (2) that such negligence was the proximate cause of the injury, and in such case the burden of proof shall rest upon the employer to rebut the presumption of negligence. But this does not deprive the employer of the right to show he was wholly free from blame, but does cast upon him the affirmative of showing that he is blameless and in effect says that the employe need not prove the employer was at fault, but the latter must show that he was free from fault.

Hunter *vs.* Colfax Consolidated Coal Co. (Iowa), 154 Northwestern, 1037, p. 1041, November, 1915.

Proceedings Being Distributed

During the past month the Bureau of Mines has distributed 8,000 copies of the proceedings of the Mining and Metallurgical Society of America meeting, which was held at Washington, December 16. This meeting was called mainly to urge upon Congress the necessity of revision the mining laws.

Director Smith Oil Land Witness

George Otis Smith, director of the Geological Survey, at the Senate lands committee's hearing on proposed relief for California and Wyoming oil operators who entered public lands withdrawn from entry by the Taft proclamation of 1909, testified that his understanding of the desire of the Government in 1909 and 1910 was that the rights and equities of these entrymen should be protected.

Prof. G. H. Clevenger, professor of metallurgy at Stanford University, stopped off in Salt Lake City en route to Stanford, after a month's trip in the East, during which time he attended the sessions of the Pan-American Scientific Congress held in Washington, December 27 to January 8. Prof. Clevenger is also a member of the United States Bureau of Mines, being a consulting metallurgical engineer. While in Salt Lake City he conferred with D. A. Lyon, in charge of the Salt Lake station of the bureau, and looked over the work being done by the Department of Metallurgical Research of the University of Utah, in flotation and other problems, in cooperation with the Bureau of Mines.

ALASKA MAKES FIRST SHIPMENT OF PYRITES

The boom in the pyrites industry in West Virginia and Tennessee continues to grow. The demand for barium chemicals continues strong and is increasing decidely. While it is known that they are being used for war purposes, no one of the Government's experts in Washingron seems to be able to explain for just what purpose they are being used.

Alaska has made its first shipment of pyrites and Colorado and Nevada probably soon will begin shipping, despite the high freight rates against which they must contend.

ARIZONA INCREASES OUTPUT OF HIGH-GRADE ASBESTOS

Never before has the United States produced asbestos in so large an amount and of such high grade as in 1915. The Arizona asbestos is of very high grade and is of special value on account of its low content of iron. This makes it particularly adaptable for use in electrical insulation.

The country has been producing its usual amount of low grade asbestos, but the great mass used by American manufacturers—which incidentally are the largest in the world—comes from Canada.

INVESTIGATING GREEN SANDS AS POSSIBLE POTASH SOURCE

In its effort to develop a commercial supply of potash in the United States, the United States Geological Survey is making an investigation of the green sands in several states with a view to making public more comprehensive as well as more authentic information regarding both the extent of these deposits and their potash content. The results of the investigations probably will be placed before chemical engineers as soon as information of merit is available.

The great extent of green sands and the ease with which it is mined, as well as its extensive distribution and proximity to large agricultural regions would make the project of extracting potash in commercial values of great importance to the nation.

RADIUM WORTH $50,000 DELIVERED IN FEBRUARY

Fifty thousand dollars worth of radium was sent to the Bureau of Mines here on the February 1 delivery from Denver. The actual quantity was 421.6 milligrams. This is the largest single delivery which has been made since the Bureau of Mines undertook radium work in Colorado. The total amount of radium which has been delivered to date is three and one-half grams. More than six grams however, have been extracted and will be delivered in course of time. The present market price for radium is $120,000 per gram.

WAR HAS LITTLE EFFECT ON PRICES OF GRAPHITE

Mexican Production Continues in Same Volume Despite Revolutions—Some Ceylon Graphite Reaching U. S.

Little change in the price of graphite has been caused by the war. An interesting report on graphite, written by Edson S. Bastin, has just been published by the U. S. Geological Survey. Some extracts from it follow:

"The form of carbon known as graphite or plumbago occurs in nature in a variety of ways and serves a great many useful purposes, chief among which are its uses in the manufacture of crucibles and other refractory products, as lubricants, for foundry facings, as stove polishes, etc. Its properties, origin and uses and its mode of occurrence at the principal localities of the United States have been fully described in the report on graphite in Mineral Resources for 1913, which will be sent free on request made to the Director, United States Geological Survey, Washington, D. C. That report also contains a bibliography of the more important publications dealing with the general character of graphite and its occurrence in this country.

"The events of the most importance in the graphite industry during 1914 were in the main the effects direct or indirect of the European war.

"Attention may be directed especially to the fact that the imports of graphite from Mexico nearly equaled those for 1913 in spite of the turbulent conditions in that republic. The imports of Korean graphite were about half again as large in 1914 as in 1913, increasing from 4,170 to 6,327 tons. The importation from Ceylon, on the other hand, was about half that for 1913.

"The two uses of graphite that seem to have shown the greatest gains during the year are its application to automobile lubrication and its use as a preparation to loosen boiler 'scale.' The effect of the graphite in the boilers is mechanical, not chemical. Being chemically inert, it cannot injure the iron of the boilers or affect the quality of the boiler water. It does not prevent the formation of scale, but the fine graphite particles by mixing with the scale during its formation render it soft and crumbly and prevent it from adhering strongly to the boiler. It can then be easily removed. It is said, moreover, that graphite is efficient in loosening old scale, the graphite particles working into the pores of the scale and between the scale and the boiler.

"In October, 1913, patents were applied for in Austria and Germany by the Aflenzer Grafit und Talkstem Werkschaft, with office in Vienna and plant at Aflenz (Steiermark), covering the use of graphite as a coloring material and filler in the manufacture of gray to black paper, pasteboard, and textiles. The process, which is especially designed for paper and pasteboard manufacture, consists in incorporating in the goods powdered graphite, which may be added dry or as a fine slime. The graphite is said to be superior to gray mineral or chemical coloring matter hitherto used, in that the color does not fade in prolonged exposure to sunlight. Streaked and spotted defects, it is claimed, are less likely to appear during the process of making the paper. The opening of a new 'flake' graphite property, three miles north of Ashland, Ala., by the Jennings Graphite Co., is noteworthy.

PRODUCTION

"As usual, the greater part of the crystalline graphite was produced by New York, Pennsylvania, and Alabama. The production of these States was all of the variety known in the trade as 'flake' graphite that occurs as small flakes forming 5 to 10 per cent by weight, of crystalline schists, from which it is separated by more or less complicated milling processes. In addition to this, a small quantity of crystalline graphite, resembling in a general way the Ceylon graphite, was produced in Montana. The total production of crystalline graphite showed, as a result of increased production in Alabama, a slight increase, both in quantity and in value, as compared with 1913. The number of producing firms was seven in all, three in Alabama, one in Montana, two in New York, and one in Pennsylvania.

"Amorphous graphite was produced by three firms, and the production was considerably below that for 1913. All of this material was of low grade, suited for paint pigment and foundry facings.

"Graphite in large quantities is manufactured by the International Acheson Graphite Co., at Niagara Falls, N. Y., which utilizes electric power generated at the Falls.

MARKETS AND PRICES

"The high prices of Ceylon graphite reached in the latter part of 1913 were maintained in the early part of 1914, but began to decline in May and June, owing to the general business depression in the United States. The decline continued until the outbreak of the European war in August, after which prices remained fairly constant until the close of the year. The prices prevailing from August to December, 1914, were from 25 to 30 per cent lower than those that prevailed in the latter part of 1913 and the early part of 1914.

"With the outbreak of the war the Ceylon graphite trade was greatly disturbed. The German markets, which in 1913 absorbed over one-fifth of the total output, were suddenly closed. This did not, however, lead to any decrease in the price of graphite in the United States, for freight rates at the same time increased, war insurance became necessary, and a German line of steamers that brought Ceylon graphite to this country ceased to operate. The increase in freight rates was due not only to the decreased number of vessels available but to the commandeering of coal at the usual coaling ports

for military purposes, thus necessitating heavy coaling at the beginning of the voyage and proportionately reducing the space for cargo. Moreover, a large number of graphite mines in Ceylon had closed even before the outbreak of the war because of a shortage in labor due to the bubonic plague and because of the flooding of mines by unusually heavy rains. According to one of the large importers, not over 25 per cent of the mines operated in 1913 were in operation at the close of 1914.

"The net result of these conditions was that the prices of Ceylon graphite in the United States during August, September and October remained at about the same level as just before the outbreak of the war.

"On October 22 the governor of the Island of Ceylon proclaimed an embargo on plumbago to all ports except British ports, and from that date until the close of the year practically no Ceylon graphite was brought into the United States. Fortunately the principal American dealers had fairly large reserve stocks, so that there was no serious shortage during November and December. Since the close of 1914 trade has adjusted itself to the changed conditions, and Ceylon graphite is now coming into this country under certain restrictions by way of London.

"Madagascar graphite continued to be imported in considerable quantity until the latter part of the year, when an embargo similar to that on Ceylon graphite was imposed by the French government. Most of this graphite, which is of the 'flake' variety, requires cleaning after its arrival in this country. It sold for $100 to $150 a ton c.i.f. New York, according to grade.

"The price of crude Chosen (Korea) amorphous graphite during 1914 ranged from $22.50 to $25 a ton c.i.f. New York City. Most of this graphite commonly carries from 80 to 85 per cent of graphitic carbon.

"Refined Mexican amorphous graphite of lead-pencil grade sold in New York during the year at 4 to 8 cents a pound. For certain grades as high as 8 cents a pound was obtained.

"Most of the American firms that produced flake graphite in 1914 reported good markets for their product. This prosperous condition in spite of the general financial depression is attributable to the shortage of Ceylon graphite. The prices were extremely variable, but, as a rule, from 6 to 8 cents a pound f.o.b. cars was obtained for the better grades of finished crucible and lubricating flake. After the outbreak of the war as high as 10 cents a pound was obtained for a few carload lots."

Report Goes to Printer

The annual report of the Bureau of Mines showing in detail the coal mine fatalities in 1915, has gone to the printer. Albert H. Fay is the author of this report.

BUREAU OF MINES POINTS OUT ERROR IN MEASUREMENT

An unusually large number of inquiries are being received at the Bureau of Mines in connection with questions discussed by G. A. Burrell in technical paper number 131. Several startling revelations are made in this bulletin. The one which seems to have called for the most discussion is outlined as follows:

For years the natural-gas industry has accepted as true in measuring natural gas, a law discovered by Sir Robert Boyle in 1662, namely, that the product of the pressure and the volume of the gas is a constant at all pressures, or that the volume of a gas varies inversely as the pressure applied to it. This is not strictly true, and neglect of the error has resulted in enormous miscalculations in natural-gas measurements. The law may be accepted as true only for pressures close to atmospheric. It so happens that billions of cubic feet of natural gas are yearly measured at pressures greater than atmospheric. Pressures of 300 pounds per square inch or greater are common. At 100 pounds per square inch an error of 3 per cent has been made, at 200 pounds per square inch an error of 6 per cent, at 375 pounds an error of 11 per cent, and at 520 pounds an error of 15 per cent has been made in may cases. Natural gas at these pressures is more compressible than an ideal gas (for which Boyle's law holds). A concrete example will make the matter clear. If 50,000,000 cubic feet of natural gas is measured per day at a pressure of 200 pounds per square inch and no correction is applied for the deviation from Boyle's law, then an error of about 3,000,000 cubic feet of gas is made. Instead of the measured amount being 50,000,000 cubic feet of gas per day, as supposed, it is actually 3,000,000 cubic feet more.

FOLIO OF CASTLE ROCK AREA ISSUED BY GEOLOGICAL SURVEY

An important geological folio just has been published by the United States Geological Survey. It is the Castle Rock folio, covering a number of counties in the south-central portion of Colorado. This folio will be of great interest to the mining men of this region owing to the number of important mines in this area.

The Survey is making a geological atlas of the United States, which is being issued in parts, or folios. Each folio includes maps with descriptive text.

Owing to the importance of the Castle Rock region it has been made the subject of very detailed study. In addition to the maps and descriptive text, the folio is accompanied by twenty carefully selected photographs. There are also a number of figures showing sections of strata and characteristic rocks.

This is the one hundredth and ninety-eighth folio which has been issued toward making up the geological atlas.

HIGH PRICE OF PROSPECTS SHUTS OUT MUCH CAPITAL, SAYS AUTHORITY

Director of Arizona Bureau of Mines Discusses Difficulties Encountered in Sole of Unproven Mining Properties—Urges Move General Use of Assay Map

By Prof. C. F. Willis

Director Arizona Bureau of Mines

During the past few months, the Arizona State Bureau of Mines has had a great many inquiries from outside the State, desiring to purchase mines. At the same time, a great many more letters have come to the attention of the Bureau of Mines for sale within the State, but there has been a great difficulty in bringing the vendors and the vendees together satisfactorily. The trouble has been largely due to two things, the lack of knowledge as to where to sell a mine and the utter disregard of any basis of figuring on the value of the mine or prospect. A short time ago trouble was encountered, owing to the inability of the buyers to get either satisfactory terms or an option with the right to further examination.

In a discussion of this question there are several points to be taken up: First, where shall I go to sell my mine? Second, how shall I present my proposition to make it sufficiently attractive to warrant a further examination, and third, what value shall I place on the property?

A COMMON QUERY

Many letters are received by the Bureau on this one point—"Kindly give me the names of purchasers of zinc mines." "Kindly let me know the names of brokers who handle mining stock on a commission," and many such. Mines are not sold like real estate, and are not peddled about the streets in the eastern cities, as seems to be the impression of many of our correspondents.

There are companies that are making a business of the development of mineral property. The Guggenheim Exploration Co., the General Development Co., the Empire Zinc Co., and many others are constantly on the watch for mining properties of promise.

However, they do not sit back in their offices and wait for a fully developed property to be handed them at almost no cost, as seems to be the impression. These companies have scouts in the field constantly; their agents are constantly traveling the mining country on the lookout for prospects of promise; they have local offices in the West where properties are investigated.

The objections one hears to dealing with these houses are about as follows: "I have written them and failed to hear anything from them." "They expect the whole property at almost no cost." "They will not give me my price." "They want to purchase a control and will then freeze me out." These are but a few of the objections one hears when one of the larger syndicates is referred to. These large corporations have hundreds and even thousands of prospects called to their attention in the course of the year, and if you are one who has written to them and failed to receive a reply, it may be due to several reasons, but more probably it is due to the fact that you either did not present your case right or that your valuation was entirely out of the question. Had you presented your proposition in good form, undoubtedly they would have written further and taken the chance on adjusting the price. The question of how to present your case in good form is taken up later in this article.

It stands to reason that these development syndicates are not in business for their health and are no different from any one else in any other business. They are going to drive the best possible bargain. Every one wishes to drive the best bargain possible, and the seller is willing to take more than his property is worth if he can get it. It is nothing but a question of bargaining, and it will be found that these larger syndicates will sometimes take chances on purchases that smaller companies cannot afford to take. Often they will pay a goodly sum for an option on a property, only to find on further exploration that the property does not live up to their expectations and the amount paid is forfeited.

HOPES ARE CAPITALIZED

Then it is unlikely that any company is going to spend any great amount of money in the development of a property without having a control, so that the seller must expect to give up at least a control, and he must not expect to receive more than it is worth. Often the prospector has his hopes capitalized very high, but the buyer will seldom pay much for this evidence of good-will.

Besides these larger buying syndicates, there are many smaller ones of which we hear but little. These are largely represented by prominent engineers, whose instructions are to be on the lookout for properties of promise. Here, again, it is largely a matter of the presentation of the case in the proper form

to gain their attention. More mines are rejected from the character of the first letters of reports received than from any other one source.

Then the Arizona Chapter of the American Mining Congress maintains an office in Phoenix, with a local branch in Globe and Tucson. One of the main objects of these offices is to bring together the buyers and sellers of mining properties, and also to stimulate interest in the industry. The Arizona State Bureau of Mines also takes care of a great deal of this work, but the great difficulty of this bureau, as well as the American Mining Congress, is due to the kind of reports that is sent in by the sellers. They do not tell the most important facts and do tell a lot that is useless as a recommendation for a property. Hence these local agencies, whose work is entirely with the idea of benefiting the industry, cannot send out lists of the owners of properties, because they have no authentic data regarding them.

If the inquiries of purchasers were merely answered by the sending of a long list of properties with no knowledge of their merits, the buyers would soon learn not to bother with these agencies, as they would but obtain a large quantity of chaff with the wheat, and the trouble of separating this chaff would be considerable. Hence it is the desire of these local agencies to be able to recommend to prospective purchasers properties which have the earmarks of promise, and which are worthy of investigation. By showing some discrimination, these local offices will soon get a good reputation in this line and will shortly be looked to by the companies desiring mines as the proper place to go to save time and trouble.

HOW TO PRESENT CASE

It will be seen from the above that the question of properly presenting your case is of the most vital importance in the selling of wade through, and has no influence on the value. Then, he must not set a prohibitive price on the mine.

During the past few months, the State Bureau of Mines has had many letters and reports relative to mining properties, but in few cases the definite information that a buyer wishes was included. Long descriptions of scenery and climate take up a good part of many reports, but these things rarely have any influence on the value of the property. The acreage owned is often brought out in minute detail, yet this has little to do with the value, as it is the size of the deposit rather than the land around it that is of interest.

Although many reports show a large acreage, it is rare to get a map showing the relative location of the claims, whereas the only real value of the acreage is either enhanced or nullified by the relative location of the claims. There will often be a statement that the vein is of a certain width, along with a lot of miscellaneous assays and the number of tons developed, all given in round numbers without any data showing the method of arriving at these figures.

It seems that few prospectors even know what an assay map is for, and not one in one hundred reports sent in give this most important data. Costs are utterly neglected, and the value of the ore is generally given as gross value, which means nothing to the engineer. It must not be overlooked that an exhaustive examination of a mine often costs up into the thousands of dollars, and it can hardly be regarded as the fault of the engineer if he cannot recommend to his client the spending of this money for an examination if his preliminary information tells him nothing. The business feature of the enterprise is almost always overlooked in a report, and the question "Will it pay?" cannot even be guessed at.

ASSAY MAPS SCARCE

Most of the mines brought to our attention have been mines with some development work, and often with some underground showing. It is not always possible to get all of the data required in a report of a prospect, but in the greater number of cases some semblance to an assay map may be made. However, it is seldom that an assay map accompanies a report, although when one does accompany a report and shows satisfactory results, buyers can almost always be induced to make further examination. Any prospector can make a sketch map showing the width of the vein at various intervals. Any prospector can sample by trenching the vein at the same intervals and put the results on the map. He may not know how to figure tonnage and value from these maps, but the engineer can figure the value if there is sufficient data at hand.

The engineer desires to know primarily if there is a reasonable chance of making it pay. Then he desires to know the composition of the ore. The costs are a most important feature of a report and particularly if any ore has been taken from the property, the actual cost of production is important, the cost of drifting, sinking, wages paid, fuel supply, etc., are important, but climate scenery topography, etc., are only of interest in so far as they affect the costs.

Then if the engineer gets the data that will allow him to do a little figuring himself, the report is more likely to be verified. There is no doubt that a great many properties of merit fail to attract attention because of the indefinite and unbusinesslike way in which the facts regarding the property are presented.

THE MATTER OF PRICE

According to Hoover, the value of a mine depends upon four factors:

1. The profit that may be won from ore exposed.

2. The prospective profit to be derived

from the extension of ore beyond exposures.

3. The effect of the price of metals.

4. The efficiency of the management during realization.

The only positive feature is the first, which may be determined by sampling or test treatment runs, and even this is but approximate. The second and third are largely speculative, and are based on geological evidence and industrial outlook. The fourth is a question of capable executive control. It is a mine. The man with the mine for sale must excite interest in his proposition, must not give inconsistent statements, but merely state what concerns the value of the property, and not fill the letter or report with a lot of useless information that takes time to absolutely impossible to value accurately any mine, as there are too many speculative factors involved. A minimum and a maximum value may be determined, the minimum being with the least risk, and the various stages above being with the greater degrees of risk. Furthermore, the life of every mine is limited, and the valuation cannot be based upon simple interest. Then the metallurgical treatment is an essential factor.

The price that a buyer is willing to pay for a mining property is dependent on the risk of loss of his investment and on the profits he estimates can be made over and above the total cost of developing and equipping. For instance, a claim on which little work is done represents the maximum of risk; the value therefore is low, whereas the mine with ore already blocked out and needing only equipment to make it pay involves little risk and the value is high. But a developed mine usually sells for more than the net profit to be derived from the ore blocked out, as it is assumed that there is an extension of the ore. This is the risk that has to be assumed by the buyer. These represent two extremes; as development increases the risk decreases.

It would be impossible to give any general rule as to the valuation of prospects or even developed mines, but if it is looked at in the light of the risk involved in the spending of money for the property and its development, it would be found that the price of many prospects would take a tumble downwards and would be nearer within reason. No legitimate mine operator is paying very much for the optimism of the prospector, but is paying for what can be seen or indicated, and many such buyers may be found ready and willing to pay all that a mine is worth to them.

METAL MINE OPERATORS LIKE NEW ACCIDENT FORM

A gratifying percentage of metal mine operators have requested the new mine accident record forms which have been prepared by the Bureau of Mines. The State of New York has adopted this form and has recommended its use to all metal mine operators.

PERSONALS

Kirby Thomas, a mining engineer of New York City, was in Washington last month.

Charles S. Keith, a director of the American Mining Congress, spent several days in Washington, early last month.

S. H. Chauvenet, an iron and steel manufacturer of Philadelphia, who has been connected prominently with the development of tin deposits in the Franklin Mountains near El Paso, was in Washington last month.

George Watkin Evans was in Washington last month on a business trip.

Samuel A. Taylor, of Pittsburgh, Pa., a director of the American Mining Congress, was in Washington on business early last month.

George I. Davis, the geologist in charge of the Pacific Division of the Geological Survey, with headquarters at Sacramento, is in Washington on business connected with his official duties.

J. S. Diller, of the U.S. Geological Survey, will address Hunter's College March 9, and on the following day will address the Physiographer's Club at the Columbia University.

James H. Gardner and F. B. Van Horn are cooperating at Tulsa, Okla., in general work as consulting petroleum geologists. Both Mr. Gardner and Mr. Van Horn formerly were with the U. S. Geological Survey.

J. L. Steele, of Landlock, Alaska, spent several days in Washington last month on business.

John I. Campion has returned to Denver from Hot Springs, Ark., very much improved in health.

A. D. Parker has resigned as President of the Colorado and Southern R. R. at Denver and will hereafter reside at Philadelphia. Mr. Parker realized a fortune from the proceeds of the Florence mine at Goldfield, Nev., discovered and developed by his prospecting partner whom he financed for many, many years before the lucky development which made both wealthy.

R. Dawson Hall, of Coal Age, was a visitor at the office of the Mining Congress last month. He was in Washington attending the Safety-First Exhibition held under the auspices of the Government.

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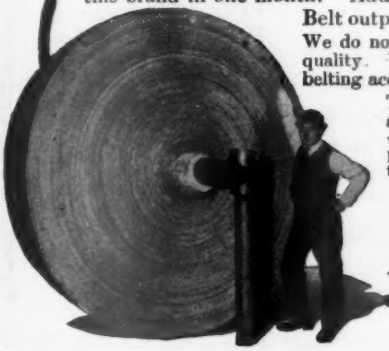

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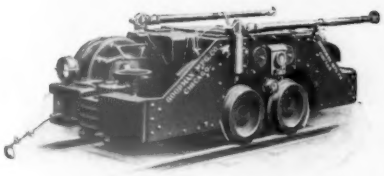

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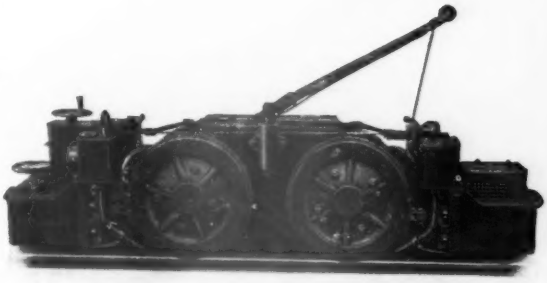

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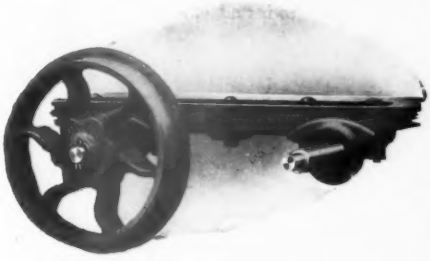

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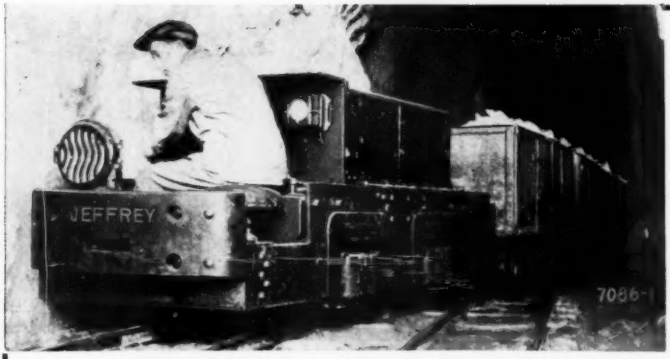

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